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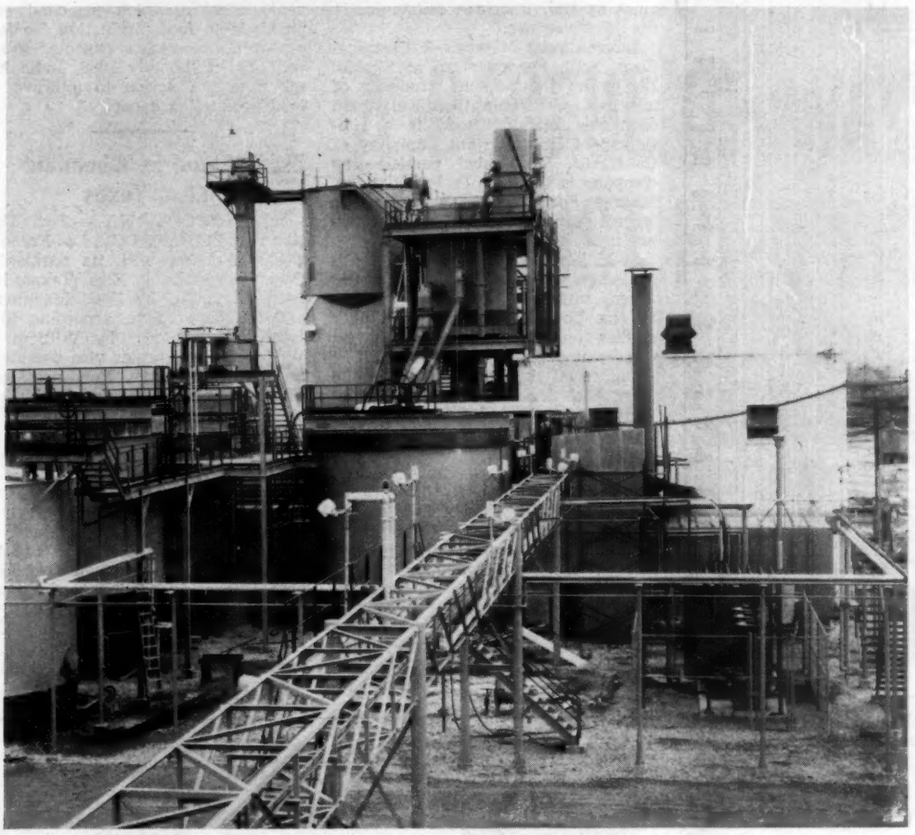

PHOSPHORIC ACID FACILITY—General Chemical Division of Allied Chemical Corp. has announced that its new phosphoric acid facilities at East St. Louis, Ill., are now in production. The plant has a projected capacity of 50,000 tons a year of wet process acid. (Story on page 44.)

News Briefs . . .

(Complete Stories Inside)

JOHN DEERE CHEMICAL CO. purchases Ozark-Mahoning Co. to broaden Deere's manufacturing scope to phosphoric acid. page 2

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PESTICIDE OUTPUT in 1960 reported to be 9% greater than that of 1959, U.S. Tariff Commission says. Sales total $28 million more in 1960, according to report page 47

No Clear-Cut Pattern Seen . . .

Uses of TVA Continuous Ammoniator Told By Fertilizer Manufacturers Via Survey

THAT THERE are wide varieties of ways in which TVA-type continuous ammoniators are used by some 150 licensees in the U.S., is indicated in results of a national survey just completed by Croplife in cooperation with the Tennessee Valley Authority. Respondents answered questions concerning the dimensions of their ammoniators, types of spargers used; the speed of the ammoniators, methods of keeping the shell clean, and other queries designed to elicit information never before obtained on such a wide scale. Plant superintendents, in answering questions, also made some astute observations regarding plant operations, equipment, and personnel.

Tabulated results of the survey are published on page 4 and subsequent pages in this issue of Croplife and, in addition, comments offered by respondents are presented editorially on page 50.

Purpose of the survey, of course, was to determine the use pattern of TVA ammoniators, success realized, the types of products being made in plants using this equipment, and suggestions how the present ammoniator might be improved.

In the latter area, an overwhelming number of plant managers said that if they were to install a new ammoniator, it would be longer than the present one. A few suggested a wider diameter for better performance, while others stated they would want an entirely different type.

The tremendous number of grades produced in continuous ammoniator plants was a matter of interest. Asked to name their top five grades, respondents did so in such variety that a simple evaluation became difficult. However, out of the 67 grades mentioned as being among the top five of plants returning the questionnaire, a few received outstanding mention. The top five of all the 67 grades named, were 5-20-20; 10-10-10; 12-12-12; 6-24-24; and 6-24-12. Other grades close to the top were 16-20-0; 5-10-10; 4-16-16; 0-20-20; and 8-8-8. Additional grades named are seen in the tabulations included in this report.

Variations are also seen in the moisture content allowed in different ratios. These ran all the way from .5% to 5%. In the 1:1:1 ratio, the range was .5% to 3%, with the largest number reporting 1%. The 1:4:4 ratio, ranged from .5% to 5%, with 2% getting twice as many votes as any other figure.

Production rate per hour had a wide variation, too. This is to be expected, of coures, with different sizes of equipment. However, interesting additional light is shed on the efficiency of ammoniators in comparing the maximum total throughput with the average per hour production rate.

Plants whose average hourly rate was reported

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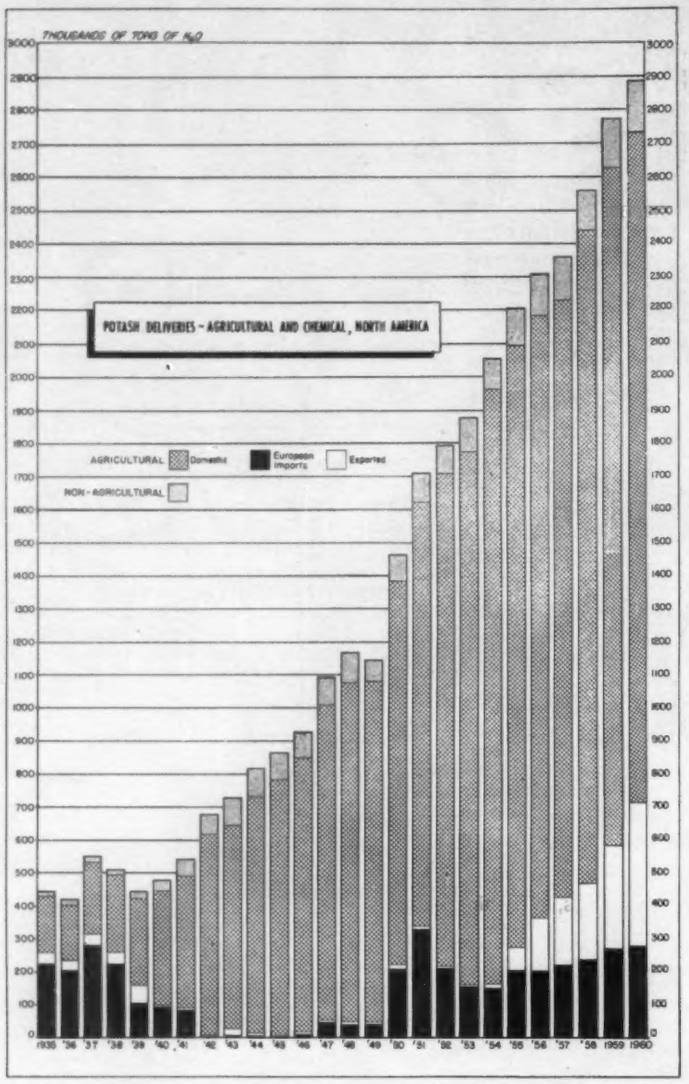


POTASH GAINS—Above graph shows how potash shipments have gained over the period 1935-1960. Note how exports have increased in past six years. (Table courtesy American Potash Institute)

API Reports '60 Potash Deliveries Down 1%

WASHINGTON—Deliveries of potash for agricultural purposes in the United States, Canada, Cuba, and Puerto Rico by the eight principal American producers and also the importers, totaled 3,953,505 tons of salts containing an equivalent of 2,305,212 tons K_2O during 1960, according to the American Potash Institute. This was a decrease of about 1% in salts and K_2O under the same period in 1959.

Continental United States took 2,-

Turn to **POTASH** page 46

Ozark-Mahoning Purchased by John Deere Chemical Co. to Broaden Latter's Scope

PRYOR, OKLA.—John Deere Chemical Co., division of Deere & Co., has announced its purchase of Ozark-Mahoning Co., Tulsa, for an undisclosed figure. Joint announcement was made by W. W. Yeandle, president of John Deere Chemical Co. and C. O. Anderson, president of Ozark-Mahoning.

Under terms of the sale, the Deere Co. will acquire the phosphoric acid and ammonium phosphate plants located near Tulsa on a 25-acre site adjacent to the O-M sulfuric acid plant.

The Ozark-Mahoning Co. will continue to own and operate the sulfuric acid plant and its extensive mining operations in various parts of the United States.

The purchase of the plant will broaden operations of the John Deere Chemical Co. in the agricultural fertilizer field. Until now its only plant has been at Pryor, Okla., where it manufactures synthetic nitrogen in the forms of ammonia and urea.

The plants sold to John Deere have been in operation for three years. They have approximately 65 employees whose employment will not be affected. Charles T. Longacker, sales manager of the operation and Norman A. Tandy, plant manager, also will continue in their present positions. The plants' products will continue to be marketed under the "Ozark" brand name through the established "Ozark" dealers.

Mr. Yeandle said combining of the Tulsa and Pryor operations under one company is a "natural tie-up," as it provides a broader range of fertilizer products which will be an important aid in marketing. In addition, he said, the close geographic location of Tulsa and Pryor simplifies any problems of united supervision and marketing.

"The John Deere Chemical Co. has been looking for ways to broaden and expand the application of its nitrogen materials. Acquiring this business will give the combined operation a full line of mixed fertilizers as well as nitrogen in the form of urea for direct application. The new combination will be basic in both the nitrogen produced at Pryor and the phosphoric acid produced in Tulsa," Mr. Yeandle said.

Completion in 1963 . . .

IMC, California Chemical Granted Indian License for $51 Million Fertilizer Plant

CHICAGO—International Minerals & Chemical Corp. and California Chemical Co., along with an Indian company, have been granted a license by the Indian government to construct a proposed $51 million fertilizer plant on the east coast of India.

The plant would produce about 350,000 tons of chemical fertilizers annually, according to an announcement by the American companies in the joint venture.

International Minerals & Chemical Corp., with headquarters in Skokie, Ill., is an independent producer of minerals. California Chemical, farm chemicals manufacturer, is a subsidiary of Standard Oil Company of California. The third participating company is the E. I. D. Parry group, Madras, South India, that country's largest private fertilizer manufacturing firm.

T. M. Ware and Fred Powell, presidents, respectively, of IMC and Cal Chem, said that with the granting of the license, complete feasibility studies on the proposed operation will be undertaken.

Individual companies will make their final decisions as to participation on the basis of these studies and after further discussion with the Indian government.

Mr. Ware said that IMC has been interested in India's fertilizer needs for some time. Teams of IMC agronomists, economists, and engineers have visited India to study the situation in the past 18 months.

Present plans call for construction of the Indian plant in the port city of Visag, near a Caltex oil refinery which will supply some of the major ingredients used in the fertilizer manufacturing process. Caltex is a Standard of California affiliate.

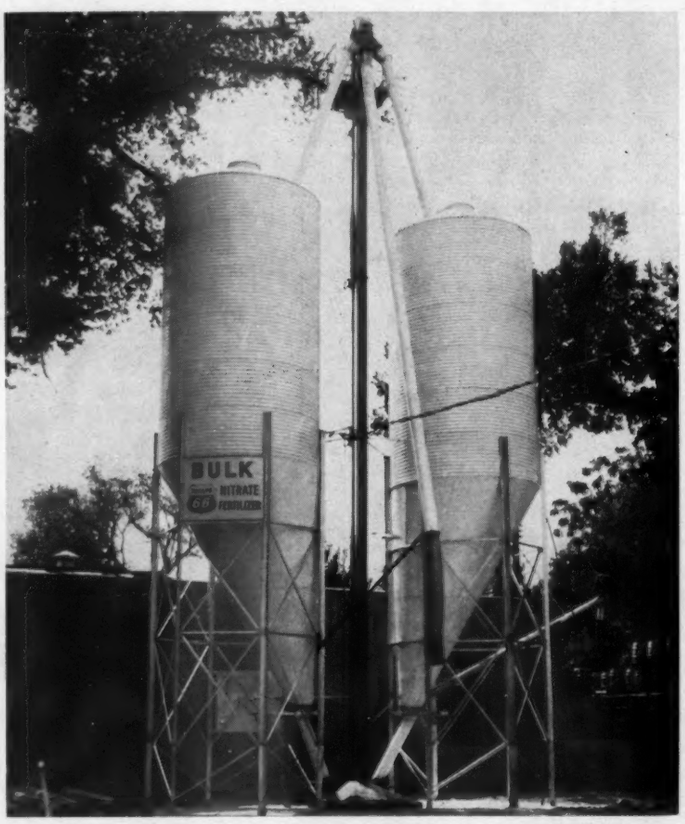
Private Indian stockholders will be invited to participate in the venture, according to the announcement. The three basic partners will provide technical know-how and manage the undertaking.

Completion of the Visag project, expected in 1963, will coincide with the third year of India's current five-year plan, in which principal emphasis is on food production. To feed a population which is expected to exceed 450 million by 1966, India has taken urgent action to improve its food production capacity.

FMC Acquires Chemical Firm at Elsa, Texas

MIDDLEPORT, N.Y.—Port Fertilizer and Chemical Co., Los Fresnos, Texas, together with its companion Port Chemical Co., Elsa, Texas, has been purchased by Food Machinery and Chemical Corp., according to a joint announcement by William N. Williams, FMC senior vice president, and John S. Chase, Port president. The acquisition was made by exchanging an undisclosed number of shares of FMC common stock for all of the outstanding shares of Port stock.

Port Fertilizer and Chemical has been identified with Texas agriculture for 25 years, as a producer of pesticides and fertilizers. In the future, it will function as an associated operation of FMC's Niagara Chemical Division, nationwide producer of agricultural chemicals. Through this new association, Port expects to broaden its products and services in local markets.



STORAGE FACILITIES—Two new metal tanks with epoxy linings are being used by Phillips Chemical Co. at its ammonium nitrate blending station, Lawrence, Kansas. The black steel tanks, made by Butler Mfg. Co., hold a total of approximately 70 tons of product. Bulk nitrate is brought in by railroad car, unloaded on a belt conveyor, and then moved to the tanks by elevator. Later, the tanks are unloaded into trucks or spreaders by a similar method. Phillips reports savings in material handling costs and says time is also reduced in delivering and spreading plant food products.

Questionnaire Results Show Wide Variety In Uses of TVA Continuous Ammoniator

Continued from page 1

at 10 tons, for example, said that the maximum throughput had been as high as 20 tons; and one plant with a 12 ton-an-hour average had achieved a maximum of 26 tons. Another plant reporting an average hourly output of 13 tons, said that its maximum had been 18 tons.

The survey also established the fact that relatively few plants operating the continuous ammoniator have a preneutralizer. Only about 6% of those replying stated that they have a preneutralization tank.

Somewhat the same story is true of separate granulators, although a larger number, totaling about 20% of the respondents, said they do have separate granulators.

Nitrogen loss was found to be a problem with many of the plants contacted. Some 60% of those answering this question said it is a problem, while the remainder declared it was not. However, some of those who wrote "no" to whether nitrogen loss was a problem also declared that losses via fumes, ammonia, or dryer existed in their plants.

In fact, ammonia losses appeared to be the greatest villain in this regard, with over 50% of respondents naming it as a prime source of nitrogen escape. Running second and third, respectively, were fume loss and dryer loss. Also mentioned was "over-granulation" and other minor causes.

Following are tables giving in more detail the answers to specific questions asked in the survey:

What Are the Over-All Dimensions of Your Ammoniator?

A considerable variety of answers were received, as noted below. Ammoniators with a diameter of 7 ft. appear to be in greatest use, but their lengths vary. However, the largest number of respondents report having ammoniators 7 ft. in diameter by 14 ft. length. The size of 6 x 12 ft. was next in popularity. The table, presented by sizes indicated by respondents, shows the percentage of those using various types of ammoniators.

Diameter (feet)	Length (feet)	% of total returns
7	14	18%
6	12	12%
7	7	8%
7	10	8%

Following were mentioned by less than 8% of respondents:
6x8 ft.; 6x10; 6x8½; 5x10; 8x14; 6x16; 5x8½; 8x16; 10x48; 4½x12; 8x12; 7x13; 5x8; 8x10; 6' 10"x14', and 6x14.

How Much of the Ammoniator Length Do You Use for Ammoniations?

Again a pattern of non-uniformity is evident. Replies ran all the way from 3½ ft. to one report of 24 ft. Use of 6 ft., 7 ft., 8 ft., and 10 ft. were most common. Replies are tabulated below, with percentage of respondents indicated:

Portion of ammoniator length used for ammoniation	Percentage of those replying
6 ft.	20%
7 ft.	16%
10 ft.	16%
8 ft.	14%
4 ft.	8%
9 ft.	6%
5 ft.	6%
7½ ft.	4%
3½ ft.	4%

Under 4% of respondents gave the following information:
4½ ft.; 24 ft.; 6½ ft.; 12 ft., and 10 ft. 3 in.

At What RPM Does Your Ammoniator Rotate?

The rotating speed of ammoniators appears to be anything but uniform in plants across the country. Replies to the questionnaire ranged from 4 r.p.m. to a high of 16. The speed of 8 r.p.m., however, was the one reported most consistently. Below is a table giving a report on answers given to the question:

R.P.M.	% of those replying
8	28%
12	10%
10	10%
16	8%
7	6%
8½	4%
11	4%
9	4%
7½	4%
13	4%

The following figures for r.p.m. of ammoniator were given by one respondent each: 6 r.p.m.; 5¼ r.p.m.; 14 r.p.m.; 7-13 r.p.m.; 4-16 r.p.m.; 6-8 r.p.m., and 9½ r.p.m.

How Do You Keep Your Shell Clean

Respondents indicated that by far more stationary scrapers are used for keeping the shell clean, than are any other methods. However, knockers were given strong mention. One plant manager replied by saying, "We use a sledge to wham the heck out of it." Another said his plant had no means to clean the shell. Below are the tabulations of replies (percentages add up to more than 100% because some plants reported having more than one type):

Type of cleaner	% of those replying
Stationary scraper	70%
Moving scraper	4%
Knockers	40%
Sledge	6%

What Type of Spargers Do You Use?

Drilled pipes are by far the most widely-used type of sparger among plants using the continuous ammoniator, according to results of this questionnaire. A number of plant managers reported having made their own spargers, while the TVA and block types showed considerable use. Below are tabulations on reported use. Percentages add up to more than 100 because some plants reported use of more than one type of sparger for acids and solutions:

Sparger type	% of those replying
Drilled pipe	68%
TVA	10%
Block type	10%
Home made	8%
Pipe with lips	4%

One mention each was made of steel slit sparger and bar sparger.

Of What Material Is Your Sparger Constructed?

Hasteloy "C" metal was reported by more respondents than was any other material, although stainless steel was almost on a par with the former. Due to ambiguity of some answers, it might be assumed that "black iron" and "heavy duty iron" might be the same metal, but described differently by superintendents. Here is the way the metals were reported (totals are more than 100% because of multiple uses in plants):

Material	% of total returns
Hasteloy "C"	40%
Stainless steel	47%
Black iron	34%
Mild steel	16%
Heavy duty iron	6%

(Carbon steel and plain "iron" were reported by one plant each.)

What Is the Life of Your Sparger?

Here is a question to which replies make up a crazy-quilt pattern. Times given ranged from a short of 10 hours for an acid sparger, to three years for solutions sparger, but the reports were in no way consistent with each other in either acid or solutions categories. While one superintendent reported sparger life of 10 hours, another said his acid sparger lasts two years. In the solutions group, reports ranged from three weeks to three years. Here is a breakdown of replies. Percentages total over 100% since some plants reported on more than one sparger:

Life use of sparger	% of total replies
Over 6 months, but less than year	18%
Less than 6 months	52%
1 Year	26%
2 Years	18%
3 Years	4%

Do You Use a Preneutralizing Tank?

In reply to this query, 84% of respondents reported not having a preneutralizing tank, and 16% said they do. The lone plant counted among the "yes" category was one plant which said it is in the process of installing one at the present time but the tank was not yet in actual operation.

Do You Use a Scrubber on Your Exhaust Gases?

Respondents appear to be fairly equally divided on this question. Of those replying to the questionnaire, 54% said they do have scrubbers, 46% do not.

What Is the Size of Your Dryer?

A great variety of diameters and lengths of dryers appears in answer to this question. Greatest diameter reported was 10.5 ft., and greatest length was 60 ft. Here is a breakdown on the sizes of dryers reported in the survey:

—Size of dryer— Diameter	Length	% of total replies
8	50	12%
7	40	10%
6	40	10%
8	40	8%
8	60	6%
6	50	6%
5	25	6%
5	35	4%
6	30	4%
8	45	4%
7	30	3%

The following sizes were given single mention: 5x28.5 ft.; 6x35; 6x25; 7x32; 4x45; 10.5x30; 5x30; 5x40; 6x36; 6.5x40; 5x24, and 10x24.

Is Dryer Cocurrent or Countercurrent?

Approximately twice as many respondents reported cocurrent dryers. The percentages were 66% on the cocurrent side; 30% on the countercurrent. The remainder of respondents failed to answer the question.

Do You Have a Separate Granulator?

Separate granulators proved to be relatively few in number among respondents. Those indicating they have no separate granulator numbered 78% of the total, while those who said they do have, made up the remaining 22%.

What Is the Size of Your Cooler?

There was no outstanding size of cooler so far as replies to this questionnaire were concerned, although more respondents reported having coolers 5 ft. in diameter by 30 ft. in length, than any other single size. Those reporting 7x40 ft. were a close second, however, with a multiplicity of single mentions given. Here is a tally of results:

—Size of cooler— Diameter	Length	% of total replies
5	30	14%
7	40	12%
8	50	10%
6	40	10%
7	30	7%
6	35	6%
5	20	6%
8	40	5%
6	30	4%

In addition to the above tabulations, single mention was given to each of the following sizes of coolers: 5x14 ft.; 7x45; 7x32; 5x35; 6x25; 6x20; 8x45; 5x40; 7x35; 7x25; 9x60, and 6x36.

What Are Your Five Most Important Grades?

A total of 67 grades were mentioned as being among the top five in various plants. A composite tally of all grades, selecting the top five on the basis of number of mentions, gives the following score:

Top five grades	Per cent of mentions from total replies
5-20-20	58%
10-10-10	52%
12-12-12	48%
6-24-12	23%
6-24-24	21%

Many other grades rated high in the tally; some barely under the top five named above. These included: 16-20-0; 3-10-10; 4-16-16; 10-30-10; 3-12-12; 0-20-20, and 14-14-14.

Other grades getting only minor mention reflect special needs for soils and crops at different portions of the country. Included among these grades were: 4-12-36; 0-15-45; 15-10-10; 19-19-0; 18-36-0; 5-10-30; 14-0-14; 8-0-24; 0-20-0; 17-7-0; 15-8-4; 19-9-0; 12-6-6; 3-9-27; 7-28-14; 10-15-0; 3-9-9; 4-8-12; 6-6-12; 11-12-14; 8-12-12; 8-9-10; 10-15-15; 16-8-8, and 3-9-18.

What Is Your Average Per-Hour Production Rate?

In keeping with the non-uniformity of answers to the questionnaire, reports on hourly production rates varied from a low of eight tons, to a high of 32 tons an hour. More respondents reported 12 tons an hour as their production rate than any other figure. However, those listing 10 tons an hour were also numerous. A figure of from 12-15 tons/hr. appeared frequently in the returns, also. Several said 30 tons, but only one reported the top of 32.

Other production rates per hour were given in several returns: 14 tons; 20 tons; 25 tons; 17½ tons; 18 tons; 17 tons; 13 tons and 8 tons. A couple of respondents guessed their production at from 25-30 tons an hour.

What Is Your Maximum Total Throughput?

A compilation of replies to this question is complex since it would be necessary to study maximum throughput figures in view of average hourly production. As a rule, however, replies indicated that maximum production is sometimes far above average hourly output. Several gave the same number for maximum as they did for average output, while others gave one figure in output per hour and the maximum throughput on an annual basis. Without knowing the number of days the plant was in operation, it was thus impossible to relate the average hourly rate to the maximum throughput.

However, here are some of the figures given on a per-hour basis:

Average hourly production rate	Maximum throughput
14 tons	14 tons
10 tons	12 tons
10 tons	14 tons
10 tons	15 tons
10 tons	20 tons
20 tons	22 tons
20 tons	30 tons
20 tons	35 tons
20 tons	25 tons
12 tons	18 tons
12 tons	16 tons
12 tons	15 tons
12 tons	30 tons
12 tons	36 tons
12 tons	20 tons
25 tons	35 tons
25 tons	40 tons
30 tons	40 tons
30 tons	50 tons
15 tons	25 tons
15 tons	25-30 tons
15 tons	18-20 tons
32 tons	40 tons

Approximately How Many Grades Do You Produce?

Here, also, the replies were widely varied. From a reported low of four, they ran to a high of 59. More plants reported having 10 grades than any other number, although significant numbers said they have 20 grades; 15 grades; 14 grades and 18. The second highest number, 40, was reported by only a single plant.

How Do You Promote Granulation of Low Nitrogen Grades?

On this question, a choice of several answers was given. These included steam, excess acid, water, granular potash, or "other."

According to the returns, water is used by more plants than acid, granular potash, or steam. However, acid and granular potash rated well, while steam rated less votes. Many plants reported using more than one method of promoting granulation. Here are the percentages of mentions given to each medium, according to the tally:

Medium	Percentage of total returns
Water	82%
Granular potash	74%
Excess acid	32%
Steam	28%
Other	8%

How Do You Control Granulation of High Nitrogen Grades?

Four means of controlling granulation were presented with the respondent asked to check the proper one or more.

Most of those replying to this question said

they control granulation by limiting the solution rate. These comprised 68% of the total. Those employing high recycle numbered 54%, while only 7% used air for controlling granulation. Those using "other" means comprised about 10% of the total. As in other instances, many respondents checked more than one item, causing the total to reach more than 100%.

◆

To What Moisture Content Do You Dry Your 1:1:1 Grades and Your 1:4:4 Grades?

Nine different answers were received for each ratio. Allowable moisture content in the 1:1:1 grade ranged from .5% up to 3% for the 1:1:1, and from .5% to 5.0% in the 1:4:4.

However, an allowance of 1% in the 1:1:1 received more mention than any other, with 42% of the respondents giving this figure. Second highest was 2%, with 28% giving it the nod.

For the 1:4:4 ratio, moisture allowance of 2% rated with 46% of the respondents, while 18% gave the figure of 1.5% moisture. Some 6% of the returns indicated that 3% moisture is allowed in their plants.

Not many respondents condition these grades, according to the returns. Some 41% said they do not, and 18% stated they do condition them. The others failed to answer the question.

◆

Do You Consider Nitrogen Loss a Serious Problem?

Replies to this query would indicate that nitrogen loss is a serious problem to many, but by no means all plant managers. Of the respondents who answered this question, 64% said they DO consider it a problem, and 31% said they do not. Others failed to check the question.

The main cause of nitrogen loss, according to the returns, is from ammonia loss. Some 53% gave this as the cause. Fume loss was second, with 32% of the mentions; and losses through the dryer were cited by 22% of the managers. In this instance, too, many multiple causes were listed, bringing the percentages to more than 100%.

◆

If You Were to Install a New Ammoniator, in What Way Would It Differ From Your Present One?

Plant managers had practical suggestions for this question. About 60% of those making suggestions, said that the ammoniator should be longer. A few, about 10% said it should be wider, while a group comprising about 15%, declared that a new ammoniator should be "completely different."

Thompson-Hayward Co. Sold to Electronic Firm

KANSAS CITY, MO—C. T. Thompson, chairman, and R. S. Thompson, president of Thompson-Hayward Chemical Co., announced recently that its board of directors had approved an agreement to sell its assets to Consolidated Electronic Industries Corp. in exchange for stock.

Thompson-Hayward is a supplier, formulator, and manufacturer of chemicals for industrial, agricultural and feed supplement uses. Its more than 800 products are sold throughout 24 midwestern states through 18 branch sales and warehouse outlets. Sales operations will now be expanded to a national level.

Total sales of Thompson-Hayward are in excess of $30,000,000 per year. No changes are contemplated in the operation or management. Thompson-Hayward's main offices will remain in Kansas City at its new facility in Turner, west of Kansas City, Kansas.

Terms of the transactions were not disclosed. R. S. Thompson stated that Thompson-Hayward would materially complement the product scope of the fine chemical, pharmaceutical, animal and plant health activities of Con Electron's subsidiary, Phillips Electronics and Pharmaceutical Corp.

APCC Reports Increased Earnings During 1960

LOS ANGELES, CAL.—Earnings of American Potash & Chemical Corp. for 1960 were the best in the company's history, Peter Colefax, president, announced Feb. 20.

Net income was $5,157,859, equal to $2.18 a share on the 2,275,538 shares of common stock outstanding at Dec. 31, 1960. In 1959 earnings were $5,149,755 equal to $2.17 a share on the 2,274,221 shares then outstanding.

Net sales totaled $50,546,003 as compared with $54,621,189 in the previous year.

Fertilizer Safety Group Reports Rise In Membership Roll

ITHACA, N.Y. — An increase in membership was reported for the Fertilizer Section of the National Safety Council at the executive committee meeting at St. Petersburg, Fla., in February. C. S. Griffith, Virginia-Carolina Chemical Corp., membership committee chairman, said nearly 300 fertilizer plant operations are receiving the services of the NSC, putting the industry in constant touch with safety advisers.

S. M. McCargo, safety director of Cooperative GLF Exchange and member of the Fertilizer Section executive committee, reports that the meeting was optimistic in tone and that a number of projects are currently under way by the section.

A. I. Raney, Phillips Chemical Co., chairman of the executive committee, said that the regional supervisory safety training schools have proved successful during the past three years and that this project will continue.

"From the time these were first introduced, over 500 supervisors have attended," Mr. Raney said. The executive committee gave unanimous endorsement to the continuation of these schools. They have been sponsored by the National Plant Food Institute, Washington, D.C., and have been under the direction of W. C. Creel, North Carolina Department of Labor.

Other projects include a safety guide book for the fertilizer industry. This project is under the direction of John E. Smith, Spencer Chemical Co., Pittsburg, Kansas. Completion of the book is set for June, 1961.

Gaither T. Newnam, Smith-Douglass Co., reported that program plans are presently under way for the annual meeting of the Fertilizer section in connection with the National Safety Council convention in Chicago scheduled for October, 1961.

TONNAGE REPORTS

ALABAMA

MONTGOMERY, ALA.—Fertilizer tonnage sold in Alabama during November, 1960, was greater by 2,244 tons than the tonnage of the same month of 1959, according to a report from R. C. Bamberg, commissioner of the Alabama State Department of Agriculture and Industries. The figures for November, 1960 and 1959, respectively, were 34,798.53 and 32,553.71 tons.

The grade 0-14-14 was the largest seller both years, although a decline was noted in 1960. That grade in November, 1959, was sold in the

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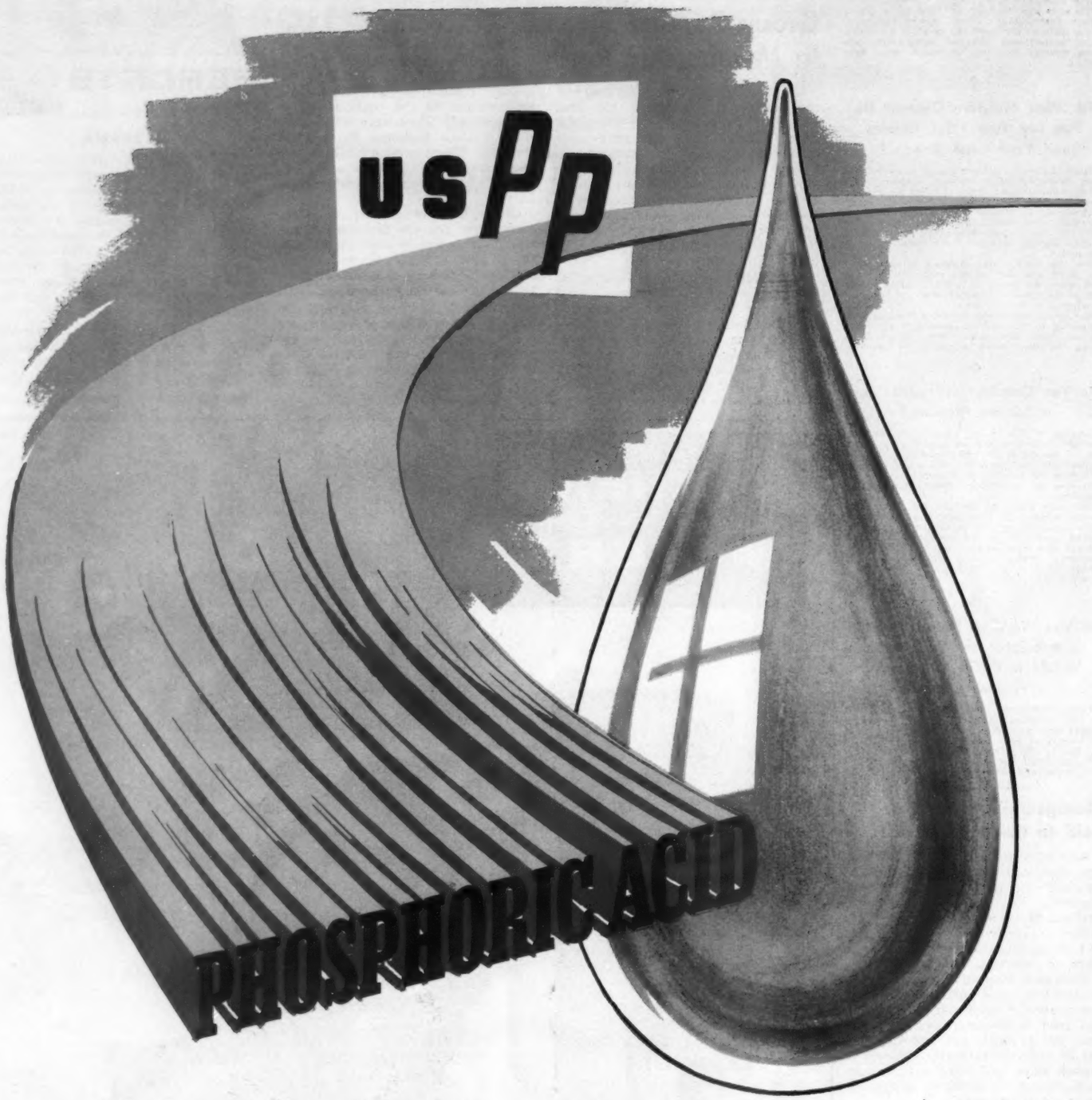
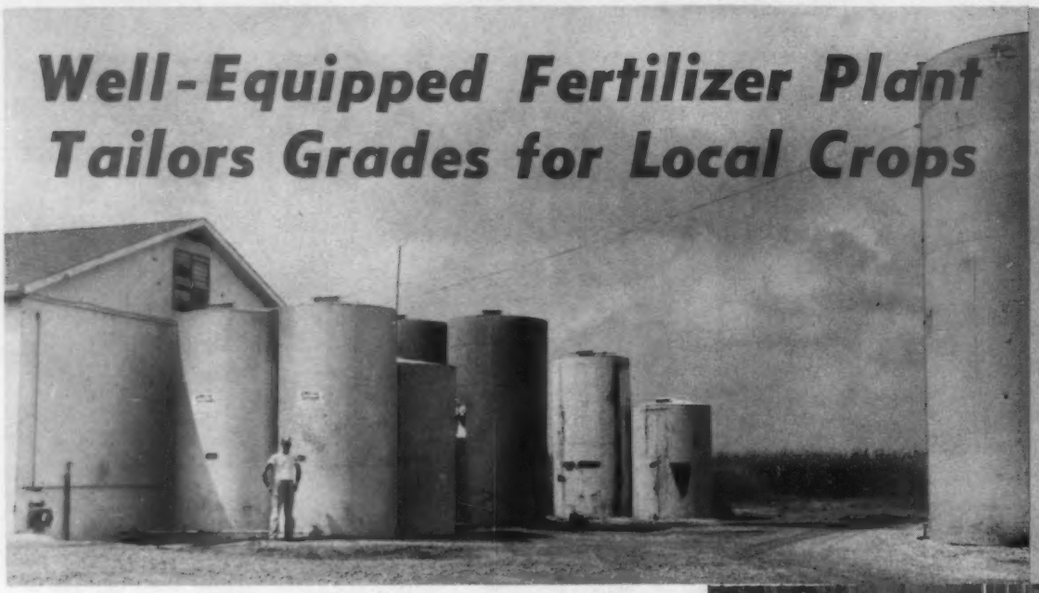


Wet Process Acid of Highest Quality
52-54% P_2O_5
Solids less than 1% by weight

Headquarters For ALL Phosphates Used In High Analysis Fertilizers

Well-Equipped Fertilizer Plant Tailors Grades for Local Crops



PLANT SCENES—At left is exterior of Martin Bros. fertilizer plant showing storage facilities for liquid raw materials. Below are additional shots of plant. Ray Armstrong, manager, is seen at control board of plant; auger from potash pile moves materials to elevator and into mixer. Front end loader keeps potash piled on auger. Bottom photo shows 20,000 gal. tanks for storage of finished plant food products. These are fitted with pumps to transfer liquid fertilizer grades to tank truck which can haul 36,000 lb. at a time.

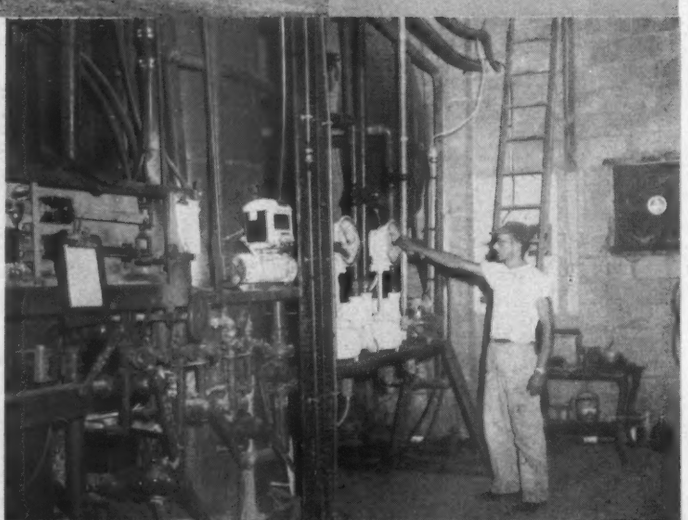
A COMPLETE liquid fertilizer plant, operated by five brothers, has licked its production problems since opening some months ago, and is now operating on a profitable basis at its Roanoke, Ill., headquarters. The Martin brothers, Lewis, Robert, John, Wayne and Eugene erected the plant a short distance from their large pellet mill for cattle feed. Most of the output of the fertilizer plant was originally planned to be used in increasing corn production and other feed ingredients, and this idea has worked out well.

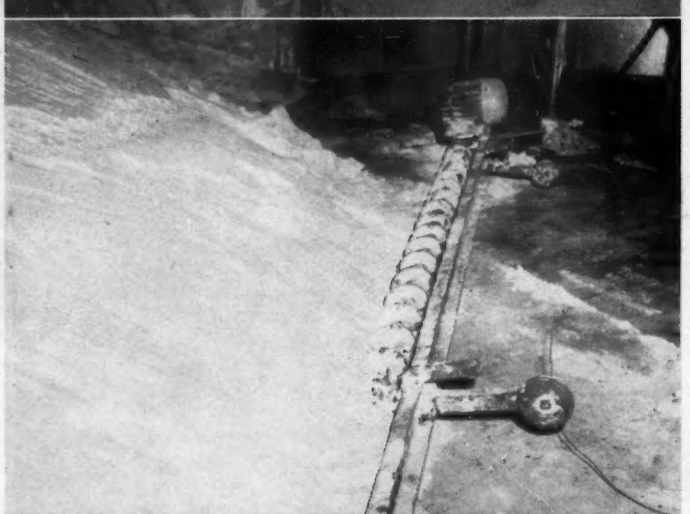
The fertilizer facility, in charge of Ray Armstrong, produces a number of grades popular in this area of Illinois. These include 12-6-6, 15-5-5, and 6-18-6 for corn, and 9-9-9 and 4-10-10 on wheat. An 8-24-0 grade is used as a starter on corn through planters, according to Mr. Armstrong, and the firm also supplies straight nitrogen to its customers.

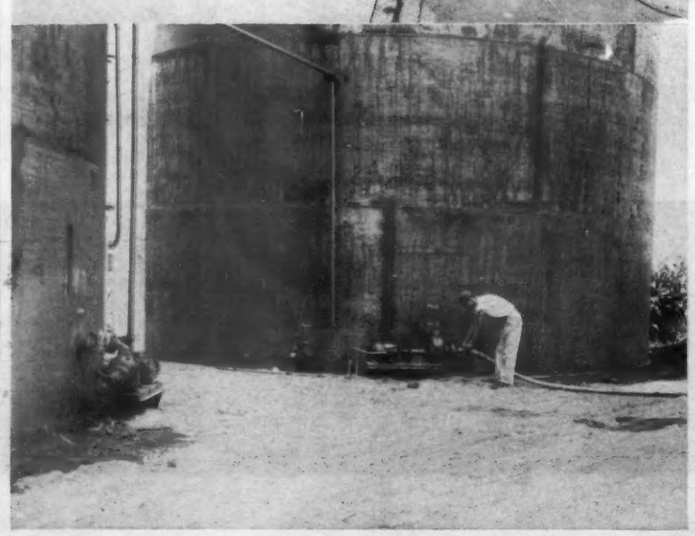
Equipment in the plant includes a stainless steel mixer tank in which five tons of liquids may be mixed at one time. After mixing, a Deming pump moves the mixture into four inside storage tanks. These latter are painted green. From this point, a Marlow pump is used to transfer the fertilizer mixture into larger tanks outside. Fertilizer storage tanks inside the plant are mostly for corn mixtures.

The four outside storage tanks at

Turn to **PLANT** page 49







How Union-Camp's 5-Star Plan saved multiwall user up to $450 per carload of bags

This is a new kind of "Big-Inch" story.

A major mid-west packer* wasn't convinced his multiwall bagging operation was all it might be. Could Union-Camp's 5-Star Multiwall Plan help?

To get the answer, Union-Camp multiwall specialists visited the plant. They found that the automatically filled bags occasionally stuck in the sewing head. Also, that the sewing line tended to "belly" and form an arc pattern. The result was considerable loss in production and frequent breakage. Another problem—the bags didn't warehouse well.

"Sew-Straight" Solution

After completing their analysis, the Union-Camp men suggested installing a "Sew-Straight" attachment right onto the sewing head. The bags could now be closed with an "E" head in a perfectly straight line. And only *1 inch* from the top of the bag. That single inch made all the difference.

Less paper—less breakage

To begin with, shorter bags could be used. The savings in paper alone cut the firm's multiwall costs from between $350 to $450 a carload. Imagine the savings based on several dozen carloads a year!

Before and After. Old, semi-circular closure pattern (left) and the new closure (arrow). Note the straight sewing line, and how close it is to the top of the bag.

The new attachment also speeded production by eliminating sewing head jam-ups. Moreover, since the top closure is now identical to the *factory-sewn* bottom closure, the bags form a perfect pillow shape—no awkward ears. This makes them easier to handle . . . easier to stack. And there's less breakage and fewer rejects.

How much could you save?

Perhaps an idea unearthed through Union-Camp's 5-Star Plan could save you money. The chances are excellent. For every day, multiwall users, large and small, are reducing their multiwall costs by capitalizing on this comprehensive packaging service. Their savings run from a few thousand dollars to over $100,000 a year.

Apart from bag construction, this economy program covers bag design, specifications control, packaging machinery, and a survey of your materials handling operation. And it costs you nothing—regardless of the brand of bags you now use.

FREE 16-PAGE BOOKLET

Write Dept. M-3 today for a free copy of Union-Camp's new 5-Star Plan booklet. It describes many case histories showing how packers like yourself have achieved greater efficiency and economy in their multiwall operation.

UNION-CAMP
MULTIWALL BAGS
Union Bag-Camp Paper Corporation · 233 Broadway N.Y. 7, N.Y.

* NAME ON REQUEST

Heat, Moisture Control . . .

Don't Let Stored Multiwall Bags Dry Out--Treat 'em Well

ADEQUATE STORAGE of multiwall paper bags in the plant or warehouse may or may not present a problem to the pesticide or fertilizer manufacturer, but in any case, the subject is one of importance. If bags are allowed to absorb excessive moisture, their durability is reduced; and on the other hand, if they are allowed to dry out unduly, a problem of brittleness results. What, then, are the proper levels of heat and moisture to maintain?

The package engineering department of Union Bag-Camp Paper Corp. has issued a booklet* giving tips on storing, handling, and sewing multiwall paper bags. It points out that the paper bag investment made by manufacturers is considerable and every effort should be made to keep the empty containers in the good condition they were in upon leaving the factory.

Heat and moisture are prime considerations. A certain amount of moisture in paper is necessary to preserve its strength and pliability. When multiwall bags are permitted to "dry out" they tend to become brittle, and this condition often causes excessive breakage in the bag filling operation and perhaps later, too, in the handling of filled bags.

At 70°F., the moisture content of paper bags will be 3% of dry weight when the relative humidity is only 10%. The moisture content of paper continues to advance, of course, in keeping with the relative humidity in the immediate environment of the bags.

*Name of booklet: "Tested Tips on Multiwall Bags."

At 20% relative humidity, paper bags will contain 4.60% moisture; at 30% relative humidity, bags will have 5.80% moisture. At 50%, they will have 7.40% of dry weight in moisture. A relative humidity of 60% raises the bags' moisture content to 8.10%.

These figures illustrate why the moisture content of paper bags can vary considerably between the time they are shipped from the plant and the time they arrive at their destination . . . or during storage. A relative humidity of between roughly 40% and 60%, giving the bags a moisture of between 6% and 8% assures the most satisfactory performance of the bags.

Agricultural chemical manufacturers may unwittingly foster the deterioration of bags by being unaware of the importance of moisture control, and storing bags in an atmosphere that dries them out too greatly. Here are some practices to avoid in bag storage:

1. Don't store bags in a hot boiler room or near a furnace. These locations quickly rob paper of its normal moisture.
2. Don't store bags in unventilated rooms or warehouses that are not adequately humidified.
3. Don't store bags in attics or under roofs which are unusually dry and extremely warm in certain seasons.
4. Don't expose bags to the air at extremely low temperatures. Moisture in paper bags will freeze just as moisture does in the air.

How should one introduce moisture into the air when storage areas are too dry? There are a number of practical methods of accomplishing this. Here are a few:

1. Store bags on skids to separate them from the floor. By hosing the floor occasionally, moisture will be absorbed into air and in turn by the bags.
2. A conveniently located steam valve may be opened to humidify the air. (The steam should not of course be aimed directly at the bags.)
3. Air kept in circulation by an electric fan operating over a large shallow receptacle filled with water will help to humidify the air.
4. Coarse material suspended in a receptacle containing water will help

Turn to **BAG CARE** page 46

Magcobar Ups Snook

HOUSTON, TEXAS—Promotion of Robert L. Snook from acting manager to manager of the industrial department of Magnet Cove Barium Corp. (Magcobar), effective immediately, has been announced by I. W. Hoskins, senior vice president-marketing.

Robert L. Snook

In the position, Mr. Snook succeeds George H. Moore, recently named vice president-marketing. He has been serving as acting manager since Mr. Moore's promotion. Mr. Snook will remain at Magcobar's Houston office.

The industrial department markets foundry bentonites, insecticide formulating clays, feed bonding agents, and similar industrial materials produced by the firm's mines and mills.

Mr. Snook has served in the industrial department since May, 1956. Before his appointment to acting manager of the department, he was the Southwest district manager. He is a graduate of the University of Texas with a B.S. degree in chemistry, and was chief chemist and plant manager for Acock Laboratories, Inc., of Austin, Texas, prior to joining Magcobar.

CORN:

One application of aldrin protects corn against all major soil insects for an entire growing season—results in better stands of quality corn

Aldrin offers one-shot, low-cost control of cutworms, wireworms, white grubs and many other pests that reduce yields and quality, cause lodging and poor stands.

Read how aldrin works and how you can use it for greater yields.

IF YOU ARE trying to get bigger yields of better quality corn from every acre you plant, *soil insects must be controlled.*

There are at least 20 different soil insects that attack corn in various stages of its growth.

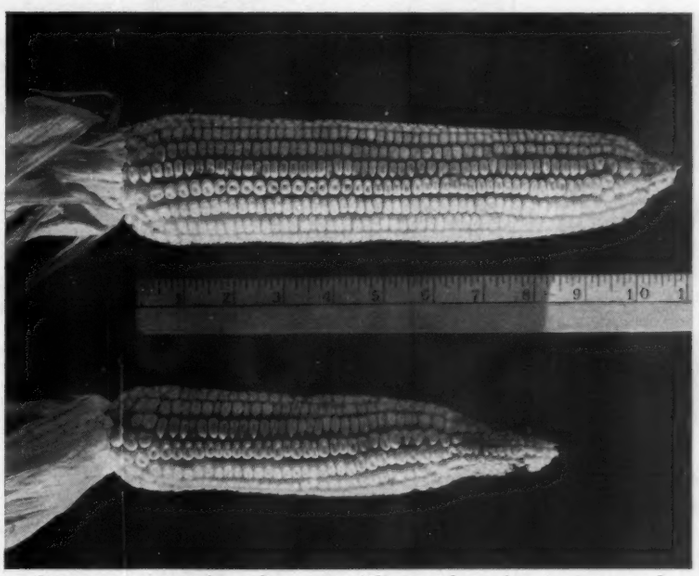
Some of the most destructive are wireworms and seed corn maggots which attack the seed itself. They interfere with germination and are the prime cause of spotty stands.

Wireworms, rootworms and white grubs attack the roots of growing plants. They sap young plants of energy and nourishment essential for productive growth and cause lodging by cutting anchor and feeder roots.

Aldrin controls them all

A single application of aldrin made either as an over-all broadcast treatment before planting or as a row treatment at planting controls all major soil insects attacking corn for an entire growing season.

Aldrin protected corn has consistently averaged a substantial increase over unprotected corn—enough extra to pay for the aldrin application at least three times over.



These two ears came from adjacent rows. The ear at the top from a row protected with aldrin. The ear at the bottom shows typical effects of soil insect activity.

Where soil insect infestations were very severe, aldrin has made the difference between a 50 bushel yield that couldn't even be picked mechanically and a hundred bushel yield standing as straight as an arrow.

Aldrin will insure a better stand, advance maturity date, prevent lodging, cut down disease losses and improve ear quality.

Where to get aldrin

Aldrin is available from your local insecticide dealer under many well-known brand names. It comes in liquid, wettable powder and granular forms—and in fertilizer mixes.

Whichever formulation you choose, always look for the name *aldrin* on the label or in the ingredient statement.

Shell Chemical Company, Agricultural Chemicals Division, 110 West 51st Street, New York 20, New York.

Shell Chemical Company

SHELL

Agricultural Chemicals Division

"Fumazone" Formulation Described . . .

How to Formulate Soil Fumigant into Oil Solutions, Emulsions, or Granules

By R. A. Biron
The Dow Chemical Co.
Midland, Mich.

EDITOR'S NOTE: This article on formulation of "Fumazone" is the second of a series of similar features to be presented in Croplife. The series, authored by technical experts of the basic producers, is designed to be of practical help to pesticide formulators in all parts of the country. The first article in the series was on heptachlor and chlordane. Watch for succeeding features on formulation problems.

◆ ◆ ◆

PROPERTIES of "Fumazone," technical product made by the Dow Chemical Co. for agricultural chemical formulators in manufacturing soil fumigant products, make it readily adaptable for formulation into emulsions, granules or oil solutions. The basic product, Fumazone, is the trademarked name for Dow's technical 1,2-dibromo-3-chloropropane. Soil fumigants containing the technical material are effective against a wide spectrum of nematode species. Fumazone products make possible the renovation of nematode-infested plants which might otherwise be destroyed.

The toxicant may be formulated into oil solutions as well as into emulsions and granules, (Table 1) and in general oil solutions appear to be satisfactory for pre-planting applications. However, certain oil carriers may be phytotoxic to many plants in many post-planting uses.

Emulsions are of particular interest since they can be injected either straight or diluted in water, be used as drenches, be applied in irrigation water and be applied in combination with certain liquid fertilizers. On the other hand, granules appeal to many growers because they can be applied with dry fertilizer applicators, thus reducing the cost of application.

Preference and cost of materials will determine usage.

Emulsifiable Formulations

Emulsifiable formulations of Fumazine are easily prepared using recommended proportions of emulsifier and solvents. (Table 2.) The ratio of aliphatic to aromatic solvents is dictated by emulsion performance, solubility and economics. Emulsifiers like "Toximul 500," "Emcol H-88" and "Triton x-160" are incompletely soluble in aliphatic solvents and therefore require aromatics for solubilization.

"Atlox 8916P" and "P-10-20-P" are soluble in the formulations without the addition of aromatics. In storage, no phase separation occurs in the 4.3 lb. per gallon formulation above zero degrees Fahrenheit and in the 8.6 lb. per gallon formulation above 20° F. Below these temperatures, phase separation occurs but reconstitutes spontaneously as temperatures elevate.

A surfactant must be added to liquid fertilizer solutions before the addition of emulsifiable Fumazone. (Table 3.)

Oil Formulations

Oil solutions of Fumazone are prepared in a manner similar to emulsifiable formulations. (Table 4.)

Granular Formulations

Granular formulations containing a broad percentage range of active ingredient can be made. (Table 5.) These formulations are applied directly to the soil. Formulators of preparations of Fumazone and fertilizer should register such products to comply with both pesticide and fertilizer laws.

TABLE 1. Chemical and Physical Properties of Fumazone

Boiling point at:	
760 mm Hg	199.9 ± 0.5° C.
300 mm Hg	164.5° C.
100 mm Hg	130.3° C.
Specific gravity at:	
15/4° C.	2.098
20/4° C.	2.090
25/4° C.	2.081
Pounds per gallon at 20° C.	17.3
Viscosity in centipoises at:	
15° C.	5.97
25° C.	4.52
Flash point	None
Fire point	None
Freezing point	5.37° C.
Vapor pressure at:	
20° C.	0.4 mm.
40° C.	1.6 mm.
Solubility, gm. per 100 gm. of solvent at 25° C.	
Acetone	Infinity
Benzene	Infinity
Carbon tetrachloride	Infinity
Ether	Infinity
n-Heptane	Infinity
Methanol	Infinity
Petroleum solvents	Infinity
Water	<0.1

Note: Some phase separation will occur at 0° F. or below in pure petroleum solvents at high concentrations. A blend of aromatic and aliphatic solvents is desirable.

TABLE 2. Proportions for Emulsifiable Fumazone Formulations
(100-pound batch)

Lb. Fumazone per gal.	Quantity Fumazone	Type Emulsifier	Quantity Emulsifier	Stoddard Solvent	Pennola 100
4.3	434 lb. or 25 gal.	Toximol 500 Emcol H-88 Triton X-160	44.5 lb. or 5 gal.	418 lb. or 64 gal.	43.5 lb. or 6 gal.
8.6	868 lb. or 50 gal.	Toximol 500 Emcol H-88 Triton X-160	61.8 lb. or 7 gal.	61.8 lb. or 9.5 gal.	243 lb. or 33.5 gal.
	868 lb. or 50 gal.	Atlox 8916P & P-10-20-P (90-30-ratio)	120 lb. or 14 gal.	36 gal.	None

TABLE 3. Proportions for Use of Fumazone Formulations in Liquid Fertilizers
(100-pound batch)

Emulsifiable Fumazone 8.6 lb. Active per gal.	Surfactant	Fertilizer
2.5 gal.	Add 3 lb. Emcol HA	97 gal.
2.5 gal.	Add 3lb. Dowfax 2 A1	97 gal.
2.5 gal.	Add 1 gal. Petrowet R	96.5 gal.

TABLE 4. Proportions for Oil Formulations of Fumazone
(100-pound batch)

Desired Pounds of Fumazone per gal.	Fumazone (Technical)	Stoddard Solvent
4.3	434 lb. or 25 gal.	490 lb. or 75 gal.
8.6	868 lb. or 50 gal.	326 lb. or 50 gal.

TABLE 5. Proportions for Granular Fumazone Formulations
(100-pound batch)

Per cent Fumazone in Granules	Fumazone	Attaclay RVM or Dry Fertilizer (mesh size as desired)
10	10 lb.	90 lb.
17.3	17.3 lb. (or 1 gal.)	82.7 lb.
25	25 lb.	75 lb.
34.6	34.6 or 2 gal.	65.4 lb.

Note: These are many emulsifiers, solvents, surfactants and carriers of various kinds that can be used in the formulation of Fumazone products. The various materials mentioned are merely listed to serve as a guide to facilitate manufacturers.

INDUSTRY PERSONNEL NEWS

To Supervise Plants

RICHMOND, VA. — William T. Corl has been appointed assistant to general sales manager in the fertilizer division of Virginia - Carolina Chemical Corp.


Wm. T. Corl

Based in Chicago, Mr. Corl will supervise V-C's Dubuque, Iowa, and East St. Louis, Ill., sales offices. He will also establish and supervise a series of custom-mix fertilizer plants. V-C's first custom-mix operation is now being readied in Wellsville, Mo.

Mr. Corl was formerly general manager of the plant food division of Darling & Co., Chicago. He was associated with Darling for ten years, serving in sales, procurement and production before becoming general manager.

He is a native of Joplin, Mo., and holds a B.S. degree from the University of Missouri.

●

Joins W. R. Grace & Co.

NEW YORK — Max M. McCaslin has joined W. R. Grace & Co., nitrogen products division, as a special sales representative in the Midwest area, with headquarters in the division's St. Louis office. The position was created to give more intensive coverage of the territory, the company says.


Max M. McCaslin

Over the past six years Mr. McCaslin was ammonia supervisor in the Midwest District of the plant food division of Olin Mathieson Chemical Corp. Prior to that he was an anhydrous ammonia sales representative with Edward J. Funk & Sons. Mr. McCaslin has also been a farmer and broker of farm commodities. He served in the U.S. Air Force from 1942-45.

●

QUARTER - CENTURY SERVICE— Leo R. Gardner, left, manager of research and development, Ortho Division, California Chemical Co., recently presented Dr. George S. Hensill with a 25-year pin in recognition of the latter's completion of a quarter-century of service to the company in research on insecticides and other agricultural chemicals. The recipient is assistant manager in the Western states for Ortho research and development.

Amoco Chemicals Names Group to New Positions

CHICAGO — Amoco Chemicals Corp. has announced a number of appointments in its manufacturing department and marketing department.

C. L. Parris was named plant manager of the recently-announced operation at Haverhill, Ohio. Jerald D. Reed was appointed plant manager at Joliet, Ill., succeeding Mr. Parris. Fred F. Diwoky in turn, succeeds Mr. Reed as manager of the firm's Texas City plant. These announcements were made by L. L. Smith, general manager, manufacturing, of the company.

Mr. Parris, a 1939 B.S. in civil engineering graduate of Texas Technological College, holds an M.S. degree from the Illinois Institute of Technology.

Mr. Reed has been manager of the Texas City plant since Amoco Chemicals was formed in 1957 and has been associated with petrochemical operations of affiliated companies from the time of his graduation from Kansas State University in 1944.

For the past three years Dr. Diwoky has been assistant to the general manager — manufacturing of Amoco Chemicals in Chicago and has held various administrative and operating positions with the company and its affiliates for the past 30 years. He holds a B.S. degree from Oregon State College and M.S. and Ph.D. degrees from the University of Wisconsin.

Amoco has also announced the appointments of William F. Christie and Don R. Carmody to newly-created positions in the marketing department. Mr. Carmody is director of overseas market research and Mr. Christie is director of market research in the U.S. Mr. Carmody joined Amoco three years ago following a seven-year association with Standard Oil Co. (Indiana).

Mr. Christie joined Amoco in 1957. He is a graduate from the University of Michigan, with a degree in chemical engineering.

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Midwest Representative

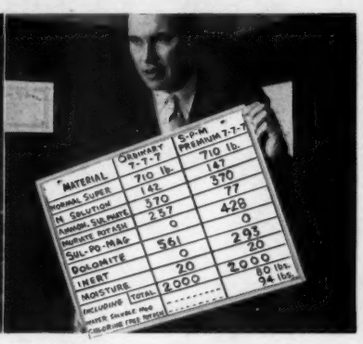
NEW YORK—Virgil C. Luman has been appointed a sales representative for Bradley & Baker, the company has announced. Mr. Luman will represent the firm in five middlewestern states, operating out of his headquarters at Columbia, Mo. States to be covered by Mr. Luman are Iowa, Nebraska, Colorado, Kansas and Missouri, according to the company announcement.


Virgil C. Luman

Another photo report on Sul-Po-Mag® customers...

How Sul-Po-Mag® leads a double life at Long Island firm

Officials of Long Island Produce and Fertilizer Company developed a double personality for Sul-Po-Mag. It earns 2 ways for them. They use Sul-Po-Mag on their own potato fields... then use this field experience to demonstrate the earning power of Sul-Po-Mag in their premium-brand fertilizer. Shown here are photo-facts on how they do it, underscoring how the Sul-Po-Mag program penetrates all phases of your fertilizer business. Your IMC sales representative can explain the complete story and show how Sul-Po-Mag gives you a solid profit opportunity, a better chance to improve sales volume.



Sul-Po-Mag reduces production problems . . . its outstanding chemical properties include water-soluble ingredients that mix and blend well, have low salt index and are neutral in reaction. Sul-Po-Mag is 18.5% magnesia, 22% potash in sulphate form (with less than 2.5% chlorine), 22% sulphur.

Sul-Po-Mag has all of the benefits of a free-flowing granular product...the uniform formulation that helps produce a balanced fertilizer. Sul-Po-Mag provides both magnesia and sulphate of potash in one product, an important inventory advantage, too.

Formulation gets premium attention on SPM program. IMC's Bob Heuerman demonstrates how a Sul-Po-Mag formulation reduces high-chlorine ingredients and adds magnesium in water-soluble form to further stimulate quality fertilizer performance. The result: an improved, balanced grade.

IMC's Sul-Po-Mag program gets to the root of selling, too. Here Lipco's vice president, Richard J. Carey, and Batchelder check with Heuerman a Sul-Po-Mag potato advertising kit. Other kits apply to tobacco, sugar beets, fruit, vegetables, general crops.

SPM identification on the bag helps Lipco brand fertilizers merchandise the premium benefits of Sul-Po-Mag . . . quickly and clearly through dramatic display covering most of the back half of the bag itself.

Scientific studies show potatoes fertilized with the sulphate form of potash yield higher specific gravity — higher total solids. Here Lipco's Cunningham gets ready to take a hydrometer reading on a new delivery of potatoes.

Frank B. Fuller

William H. Payne

S-D Advances Two

NORFOLK, VA. — Smith-Douglass Co. has announced the advancement of William H. Payne, sales supervisor in the Raleigh, N.C., territory, to the position of assistant manager for sales of the Norfolk branch, supervising sales territories in North Carolina.

Mr. Payne has supervised Smith-Douglass' Raleigh territory for the last eight years and has been with S-D since 1936.

Frank B. Fuller has been appointed to succeed Mr. Payne in the Raleigh territory. Mr. Fuller, 28, has been employed by Smith-Douglass since 1956. He graduated from Virginia Polytechnic Institute in 1954 with a degree in agronomy.

●

Bag Executive Advances

NEW YORK—Tom L. Jones has been appointed sales manager in charge of multiwall bag sales of Gilman Paper Co., with headquarters in New York. Mr. Jones was formerly special representative for Kraft Bag Corp., which, following a merger on Jan. 31, 1961, became the Kraft Bag Division of St. Marys Kraft Corp., subsidiary of Gilman Paper Co.

Before joining the Kraft organization, Mr. Jones was vice president and director of multiwall sales for Arkell & Smiths.

Officers Named by Firm

CHICAGO — Lewis G. Blessing, president of Bastian-Blessing Co., since 1931, has been elected chairman of the board. Allison L. Augur was elevated from executive vice president to president, and Lawrence N. Lucas rises from vice president to executive vice president, the company has announced.

The company manufactures high pressure gas valves, regulators and fittings at its Chicago plant.

●

Fulton Vice President

SAVANNAH, GA. — B. P. "Phil" Barnet was recently elected vice president of Fulton Bag & Cotton Mills, Inc. of Savannah, Ga. He joined Fulton in 1947 representing the company as a salesman in the Middlewest.

Mr. Barnet is a graduate of Union College, Schenectady, N.Y.,

John Hageman

Kenneth Kardux

Retires from Scale Firm

CLIFTON, N.J. — John Hageman, sales representative for Richardson Scale Co. in the Buffalo, N.Y., area, has retired from active service with the company. He is succeeded by Kenneth Kardux, who will cover the Toronto, Ontario, district in addition to the western New York territory. Mr. Hageman will continue to serve as sales consultant for Richardson in the Buffalo-Toronto area.

●

Joins Bennett Chemical

DENVER, COLO.—Bennett Chemical Co., Denver, has announced the appointment of William F. Mierke to be in charge of the company's products sales. Bennett manufactures secondary and trace element fertilizers in granular form.

Wm. F. Mierke

Mr. Mierke, an agronomist, was with Tennessee Corporation for the past 6½ years and before that time, was associated with International Minerals & Chemical Corp. He is a graduate of the University of Missouri and will make his home in Denver.

●

Man of the Year

PORTLAND, ORE.—H. W. Kinney has been named "Northwest Agricultural Chemical Man of the Year" by the Western Agricultural Chemical Assn. The award was announced at the Northwest Agricultural Chemicals Industry Conference held at Portland, Ore., in January.

H. W. Kinney

Mr. Kinney, a resident of Yakima, Wash., is Northwest regional sales representative for Chemagro Corp., Kansas City, Mo. He is a 1949 graduate of Washington State University where he majored in entomology.

Western Agricultural Chemicals Assn.'s annual "Man of the Year" award is presented to the agricultural chemicals salesman in the Northwest whose qualifications most nearly conform to those of the ideal salesman as determined by the association's eligibility committee.

●

Two Join Niagara Staff

MIDDLEPORT, N.Y. — Two new additions to the research and development department have been made by Niagara Chemical Division of Food Machinery and Chemical Corp. They are: Thomas Bradshaw as a chemist in the department's formulation group; Richard P. Stanovick as analytical chemist in the residue analysis group.

Mr. Bradshaw will be concerned with work on new pesticide materials as well as a search for improvements in existing formulations. He joins Niagara after serving with Plant Protection, Ltd., England, for the past two years. He is a chemistry

graduate of North Hampton Polytechnic Institute, London.

Mr. Stanovick will engage in developing new, improved techniques for determining chemical residues. He attended the University of Georgia under an Atomic Energy Commission Scholarship and was graduated with B.S. and M.S. degrees in 1959 and 1960, respectively. In his senior year he was named outstanding agronomy student in the state of Georgia by the Georgia section of the American Agronomy Society.

●

To New Co-op Post

RICHMOND, VA.—W. T. Steele, Jr., former manager of the Southern States Cooperative fertilizer plant in Baltimore, and manager of the fertilizer service, has been named general manager of the Southern States organization. He succeeds Howard H. Gordon, who has been general manager since April, 1959, a position he assumed after the death of O. E. Zacharias, Jr.

●

Plant Manager Named

RENO, NEV.—Henry S. Curtis, plant manager, American Potash and Chemical Corp., Henderson, Nev., has been elected first vice president of the Nevada Mining Assn., Inc.

Other officers named were Robert O. Jones, western division manager, the Standard Slag Co., Gabbs, president; A. C. Kinnear, Jr., general manager, Kennecott Copper Corp.'s Nevada Mines Division, McGill, honorary president; Roy A. Hardy, owner, Adelaide-Crown Mine, Humboldt County, second vice president; Louis D. Gordon, Reno, executive secretary.

To Tech Service Post

ATLANTA, GA.—U. S. Phosphoric Products, Division Tennessee Corp., has announced expansion of its technical service with the appointment of Owen A. Niles, Jr., as technical service representative. He will serve the New England and Mid-Atlantic states and will live in the Baltimore area. Mr. Niles has been with USPP since 1948 and has wide experience in all phases of its Tampa operations. He is a native of Rhode Island and has a B.S. in chemical engineering from the University of Rhode Island.

Owen A. Niles, Jr.

Hugo Riemer | James M. Gerstley

Hugo Riemer Named New President of U.S. Borax

LOS ANGELES — Hugo Riemer, former executive vice president, has been elected president of U.S. Borax & Chemical Corp. and James M. Gerstley, former president, has been named vice chairman of the board, it was announced Feb. 20, at the annual meeting of shareholders held in Los Angeles.

Speaking for the board of directors, F. A. Lesser, chairman, stated that the management change resulted from a request by Mr. Gerstley to play a less demanding, though continuing role with the company in order to be able to devote more time to other activities. In the newly created position of vice chairman, Mr. Gerstley will continue to serve the company with special responsibility for long range planning.

Mr. Riemer joined the company as executive vice president in October, 1958. From 1935-58 he was associated with Allied Chemical Corp. in New York City. Initially, Mr. Riemer was a senior attorney in the chemical firm's legal department, then moved into the management field as assistant to the president of Allied's Solvay Process Division. Subsequently he served as vice president and then as executive vice president of this division. His last post at Allied Chemical was as president of the Nitrogen Division, which he held from 1953 to 1958.

Mr. Gerstley originally joined Pacific Coast Borax Co., predecessor organization to the present corporation, in 1933 as assistant to the general manager. In 1946 he became chief executive officer. In 1956 Pacific Coast Borax merged with U.S. Potash Co. and the new organization was named U. S. Borax & Chemical Corp. Mr. Gerstley was elected president of the merged company at the time of its formation.

●

Names Distributor

BUFFALO, N.Y.—Schutte Pulverizer Co., Inc., has appointed General Mill Supply, Inc., Marion, Iowa, as its new factory distributor and warehouse in the Midwest.

In announcing the appointment, Herman D. Schutte, president, said the Iowa firm will stock a complete line of Schutte hammermills and parts to assure immediate delivery throughout its Midwest sales territory.

●

Retires From Niagara

MIDDLEPORT, N.Y.—Retirement of Horace W. Lee, a veteran sales executive of the Niagara Chemical Division of Food Machinery and Chemical Corp., has been announced by the company. He has been associated with Niagara for 41 years.

Horace W. Lee

A familiar figure to growers throughout the cotton belt, Mr. Lee served as manager of Niagara's southwestern district for a number of years. During this period he was also responsi-

Turn to PERSONNEL page 40

New Urea Process on Stream at Kansas Site

NEW ORLEANS, LA.—Chemical Construction Corp., New York, designer and builder of chemical, petrochemical and petroleum process plants, has announced the first successful commercial scale operation of its new process for production of urea. The plant, designed and built for Cooperative Farm Chemicals Assn., Lawrence, Kansas, has been in continuous operation there since Jan. 1.

Lucien Cook, chief engineer of Chemico's urea division, describes the process as employing the principle of carbamate solution recycle, which he said facilitates the complete consumption of the ammonia and carbon dioxide used as raw materials. Mr. Cook added that the operation requires a minimum amount of equipment and utilizes only a small quantity of water for the recycle of unconverted ammonia and carbon dioxide, which, he says, results in a high concentration of urea product before the evaporation stage.

Iowa Representative

RICHMOND, CAL. — Lester D. Dark has been named agricultural sales representative for the Ortho Division of California Chemical Co.

Colorado Agchem Group Elects New President

DENVER—The Colorado Agricultural Chemicals Assn. recently elected as president B. J. Fitzgerald, Shell Chemical Co., Boulder, Colo., succeeding E. H. Macomber of American Cyanamid Co., Boulder.

During the group's recent annual meeting Irwin Elliott, Chemagro Corp., Littleton, and D. E. Garrison, Balcom Industries, Greeley, were named directors. Gale Harold, Stauffer Chemical Co., Denver, was elected vice president, and Don Sjoquist, Niagara Chemical Co., Boulder, secretary-treasurer.

CALIFORNIA WEED OFFICERS NAMED

SAN FRANCISCO — Oliver A. Leonard, University of California, Davis, was elected president of the California Weed Conference at the group's recent annual meeting here. He succeeds Stanley W. Strew, Colloidal Products Co., Sausalito, Cal. Charles C. Siebe, state department of agriculture representative, La Puenta, was named vice president. William L. Hopkins, AgriChem Industries, Davis, was made secretary, and James Dewlen, Amchem Industries, Riverside, treasurer.

Davison Closes One Mine in Florida; Then Expands, Modernizes at Another Location

BALTIMORE, MD.—W. R. Grace & Co. Davison Chemical Division has completed extensive modernization and expansion of phosphate rock mining facilities at its Bonny Lake mine, at Ridgewood, Fla. This modernization followed closing of the Davison Pauway No. 4 mine near Lakeland, Fla., after nearly 40 years of operation in this vicinity.

Two draglines, flotation and other beneficiation equipment at Pauway No. 4 were transferred to Bonny Lake. At the same time, much new equipment was installed to increase capacity at Bonny Lake.

The washer receives matrix from two mining areas. Plus 14 mesh material is removed by screens and separated into coarse and fine end products. The minus 14 mesh material passes first to cyclones which separate slimes, and then to a completely new feed preparation section, employing drag-rake classifiers, hydrosillators and screens.

Two Dorr-Oliver hydrosillators have been installed, said to be the first time such equipment has been used in the Florida phosphate field. New DSM (Dutch State Mines) screens and conventional vibrating screens provide further size breakdown.

In the feed preparation the material is separated into three fractions. One is a coarse fraction end product.

Davison uses phosphate rock in normal and triple superphosphate, diammonium phosphate and phosphoric acid manufacture; supplies it for direct application to the soil, and to other processors in the U.S. and abroad.

A unique feature of the Pauway No. 4 operation, now concluded, was the rehabilitation of an area of mined-out land on the outskirts of Lakeland. Dredging, filling, and other landscaping was done to transform the area into a residential subdivision, complete with artificial lakes.

SOIL TESTS REPORTED—How soil-testing practices in five counties in Arkansas aid fertilizer sales in the area was reported by D. Waldon, extension soils specialist of the University of Arkansas at the recent 10th annual plant food conference in Little Rock. Mr. Waldon and other speakers said that special emphasis on soil fertility increased soil testing 129% in the five-county test area as compared to an increase of only 6% statewide. Total plant food usage was up 13% as compared to 6% statewide.

125 Attend Arkansas Plant Food Conference

LITTLE ROCK, ARK.—Some 125 fertilizer industry people and professional agricultural workers attended the recent 10th annual plant food conference here. Featuring talks by agronomists and soils experts, the conference covered various fertility factors influencing crop yields.

Soil testing as a means of determining fertilizer needs was discussed as was the technique of leaf analysis in predicting fertilizer needs for horticultural crops.

The Arkansas Plant Food Educational Society elected officers for 1961 at the conclusion of the conference. Those named were: R. L. Morgan, Ark-Mo Plant Food Co., Corning, Ark., president; A. L. McQuary, Delta Fertilizer Co., Helena, Ark., vice president; L. A. Dhonau, Arkansas Plant Food Co., North Little Rock, secretary-treasurer.

Named to the board were: Dr. Niven D. Morgan, American Potash Institute, Inc., Shreveport, La.; E. L. Pierson, Olin Mathieson Chemical Corp., North Little Rock; George L. Scruggs, Davison Chemical Co., Tulsa, Okla.; Paul Lovett, Farmers Liquid Fertilizer Co., Patterson, Ark.; Gene Morgan, American Cyanamid Co., North Little Rock; Paul Talley, Planters Fertilizer and Soybean Co., Pine Bluff, Ark.; G. E. Davis, Anhydrous Ammonia Assn., Lepanto, Ark., and Doug Kelly, Monsanto Chemical Co., El Dorado, Ark. Ex-officio board members are: E. K. Chandler, National Plant Food Institute, Shreveport, La., and Woody N. Miley, extension soils specialist, Arkansas agricultural extension service, Little Rock.

Custom Officials Seize Pesticide Shipment

MIAMI, FLA.—A shipment of 1,100,000 lb. of insecticides was seized recently by U.S. Customs Service inspectors here to prevent its being sent indirectly to Cuba. Custom officials estimated the value of the shipment at $150,000, and reported that the goods were consigned to a Mexican trading firm. They said there were indications that the cargo would have been diverted to a Cuban port.

The Panamanian ship El Cholo was in port for more than a week waiting to take the shipment aboard, but finally left without it.

Another shipment of some 1,400,000 lb. of insecticide was reported being detained at Houston, Texas, pending further investigation, but was not immediately seized.

OM Sales Reported

NEW YORK—Net sales of Olin Mathieson Chemical Corp. in 1960 were the second highest in its history, totaling $689,623,000. This was a decline of 1.8% from the record high of $702,032,000 in 1959, the company has announced.

Net profits from U.S. and Canadian operations, including dividends, fees and royalties actually received from overseas affiliates, amounted to $34,669,000, or $2.59 per share, in 1960, compared with $37,416,000 or $2.81 per share, in 1959, a decline of 7.8%.

Consolidated net income reflected a charge of $670,000, or 5¢ per share, to write off the corporation's Cuban assets seized during the year by the Castro government.

PILOT KILLED

DAVENPORT, IOWA—Robert W. Danforth, 35, Monmouth, Ill., operator of a commercial crop spraying service, was killed Feb. 17 when his plane crashed near Viola, Ill. Witnesses said a truck crew had just put 600 lb. of commercial fertilizer aboard his plane, and the plane was not yet airborne, when a wing tip struck a tree. The plane was demolished.

Back to Manhattan

Big Chief Kay-Two-Oh is headed back to Manhattan Island. It's not that the Paleface has decided to give Manhattan back to the Indians . . . just that the Chief feels that he can better serve his many customers from new sales offices in a towering tepee in the heart of the asphalt jungle.

You are cordially invited to drop by for a few puffs on the peace pipe whenever you are in the neighborhood, but at any time remember that the P.C.A. Chief's services are as close to you as your nearest tom-tom. Call New York, LT 1-1240, or TWX NY - 1 - 5386.

If you've got a problem the Chief can help you solve, he's always glad to tell you "How".

As of February 1, our General Sales Office will be located at:
630 Fifth Avenue, New York 20, N. Y.
Phone: LT 1-1240
TWX: NY 1-5386

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Consumers Cooperative to Begin Building $8 Million NH_3 Facility at Nebraska Site

HASTINGS, NEB. — Construction of the $8 million anhydrous ammonia fertilizer plant to be built by Consumers Cooperative Assn. at Hastings, Neb., will begin by April 1.

R. R. Zurbuchen, general manager of the Cooperative Farm Chemicals Assn. at Lawrence, Kan., announced that the way had been cleared by the Federal Power Commission's approval of the contract between CCA and the Kansas-Nebraska Natural Gas Co. for gas service.

Mr. Zurbuchen, who will supervise construction of the plant for CCA, said the general contractor will be the Chemical Construction Corp. of New York. He said the firm's construction superintendent, W. W. Stewart, was expected to arrive in Hastings about March 15 and that at peak construction the firm will employ about 250 men.

The plant, wholly owned by CCA, will be located about three miles east of Hastings on U.S. Highway 6 and the Burlington railroad.

Mr. Zurbuchen said he expects the plant to be in operation by Nov. 1. It will employ about 100 persons and is designed to produce 200 tons of anhydrous ammonia a day.

CCA holds three-fourths ownership in the Lawrence, Kan., plant, which Mr. Zurbuchen regularly manages. It has capacity for 380 tons of anhydrous ammonia a day. It also produces ammonium nitrate, urea, and non-pressure nitrogen solutions.

To Southern Nitrogen

SAVANNAH, GA. — Southern Nitrogen Co. has announced the appointment of B. E. Cooper as sales representative in the company's South Carolina sales territory.

For the past five years Mr. Cooper has been selling mixed fertilizers and direct application nitrogen solutions in South Carolina. He is a native of Blackville, S.C., and attended Presbyterian College in Clinton, S.C. He entered the U.S. Army in 1942 and served until 1945.

Tolerance Folder Issued

RICHMOND, CAL.—United-Heckathorn has announced the availability of its newly-revised wallet-sized tolerance folder giving the latest limitations on use of 45 pesticidal chemicals before harvest on major food crops, effective Jan. 15. Copies of the folder are free from the company's home office, 600 S. 4th St., Richmond, Cal., or the Eastern office, 415 Lexington Ave., New York.

NEW DEPARTMENT NAME

MILWAUKEE, WIS. — The name of Allis-Chalmers pump and compressor department has been changed to the Fluid Dynamics department, the company has announced. Allis-Chalmers has been manufacturing and selling fluid machinery for many years.

SOUTHERN WEED CONFERENCE ELECTS

ST. PETERSBURG, FLA. — Dr. Walter K. Porter, superintendent of the Delta Branch Experiment Station, Stoneville, Miss., will serve as president of the Southern Weed Conference in 1961. He was elected at the recent meeting of the SWC here.

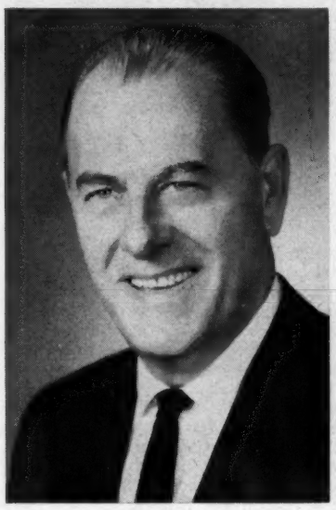
Other officers named are: Dr. John T. Holstun, Agricultural Research Service-U.S. Department of Agriculture, Stoneville, vice president, and Dr. R. E. Frans, Department of Agronomy, University of Arkansas, Fayetteville, secretary-treasurer.

Executive committee members are Dr. Ellis W. Hauser, ARS-USDA, Georgia Experiment Station, Experiment, Ga.; Dr. Don E. Davis, Auburn University, Auburn, Ala., and Douglas Boatright, Chipman Chemical Co., Bessemer, Ala. Dr. R. A. Darrow of Texas A&M College, immediate past president, was elected to serve as SWC representative to the Weed Society of America meeting in December, 1961. Dr. C. G. McWhorter, ARS-USDA, Delta Branch Experiment Station, Stoneville, Miss., was elected alternate representative.

The 1962 Southern Weed Conference will meet Jan. 17-19 at the Hotel Patten, Chattanooga, Tenn., and the 1963 meeting is scheduled at the Admiral Semmes Hotel in Mobile, Ala., Jan. 16-18.

SIGNIFICANT BOLT—Canada's Finance Minister Donald M. Fleming (left) receives a golden bolt from Thomas M. Ware, president of International Minerals & Chemical Corporation, signifying the opening of Canada's potash deposits to world markets in fiscal 1961-62. Looking on (center) is Dr. C. F. Wilson, consul general of Canada in Chicago. The bolt is a golden replica of one expected to be used late in March to complete a 3,500-ton cast-iron lining inside the company's shaft at Esterhazy, Saskatchewan. The liner, used for the first time in this hemisphere, walls off a troublesome underground strata of quicksand that had blocked the development of Canada's potash deposits, said to be the world's largest high grade reserves.

Production MAN of the MONTH



Robert H. Breininger

20 Years' Experience In Making Pesticides Is Basis for Citation

THE QUALIFICATIONS which placed Robert H. Breininger in line for a "Production Man of the Month" citation are the result of over 20 years' experience at Amchem Products, Inc., Ambler, Pa., where he is production superintendent.

Amchem (formerly the American Chemical Paint Co.) manufactures a complete line of weed and brush killers and plant hormones, as well as industrial chemicals. The company began its business life in Philadelphia in 1914, shortly after its founder, the late James Harvey Gravell, pioneered the first phosphoric acid cleaner and rust remover for metal to answer the critical needs of the first all-steel automobile bodies. The company entered into the manufacturing of agricultural chemicals in 1937 and is probably best known for being the originators of 2,4-D and 2,4,5-T chemicals.

In his present capacity, Bob Breininger directs the manufacturing and packaging of thousands of tons monthly of both agricultural and metal-working chemicals. Bob started out in life in the retail food business shortly after graduating from the Taylor Business College, Philadelphia, where he majored in business administration. He switched to chemicals in August, 1940, when he joined Amchem as a chemical operator, advancing to production supervisor of agricultural chemicals ten years later. In 1955 he was appointed production superintendent.

The reputation for the high quality of its products, which Amchem has earned over the years, is due in no small measure to the efforts of Mr. Breininger and his three assistants, not only in directly supervising the activities of the working personnel but in instilling in the latter group a sense of responsibility for maintaining these quality standards.

Indicative of this ability to delegate responsibility is the systematic way in which the running inventory is controlled. As a result of this efficiency, Amchem is able to make prompt shipments of its many products to customers throughout the world. Naturally, credit for this phase of the operation belongs to Bob.

The Production Man of the Month was born in Ambler, where Amchem has its headquarters. The firm also has plants in St. Joseph, Mo., Niles, Cal., and Windsor, Ontario, in addition to sales and service offices in Detroit, Mich.

Mr. Breininger still lives in the Ambler area with his wife and two daughters.

NEW ADDRESS

DECATUR, GA.—A new office address has been announced for the Southern office of the American Potash Institute. J. Fielding Reed, Southern director, is now located at 403 W. Ponce de Leon Ave., Decatur. The office was formerly located in downtown Atlanta. The new telephone number is 377-2510.

USDA FINDS WAY TO REAR FACE FLIES FOR CONTROL TESTS

WASHINGTON—Year-round research to find ways of controlling the face fly has been made possible by development of a laboratory method of rearing these flies, the U.S. Department of Agriculture reported recently.

John H. Fales and his co-workers of USDA's Agricultural Research Service have succeeded in propagating the insects through eight generations in an effort to build a colony large enough to permit experiments aimed at development of suitable control measures.

The face fly, Musca autumnalis, looks like a house fly. It is common in Europe and Asia and was first found in the United States (New York State) in 1953. When present in large numbers, this livestock pest reduces production in dairy cattle and holds down weight gains in meat animals.

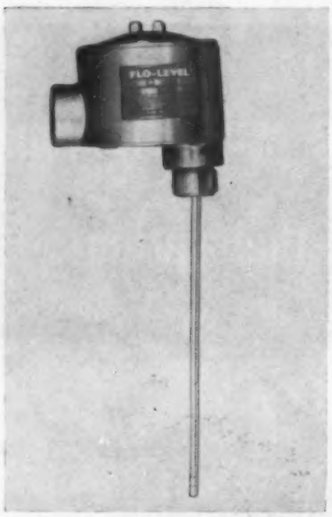
Keys to laboratory propagation of this insect, the entomologists found, are proper diet and light. The adult flies are now being fed a highly nutritious diet of skim milk, sugar, pollen, raw beef, malt extract, brain-heart infusion, mucoproteins from animal intestines, and fresh cow manure. One by one these items are being omitted from the diet in order to determine which of them are essential dietary requirements. Sun lamps and daylight fluorescent lights are used to simulate natural sunlight needed to stimulate egg laying.

WHAT'S NEW IN PRODUCTS · SERVICES · LITERATURE

To obtain more information about items mentioned in this department simply: (1) Clip out the entire coupon in the lower corner of this page. (2) Circle the numbers of the items of which you want more information. Fill in the name and address portions. (3) Fold the coupon double with the return address portion on the outside and fasten the edges with a staple, cellophane tape or glue. (4) Drop in the mail box.

No. 9333—Level Control Indicator

Flo-Tronics, Inc., has announced the availability of a new type level control for mounting on bins, hoppers, tanks or other containers holding dry, semi-dry or liquid materials. Model L201 level control is provid-



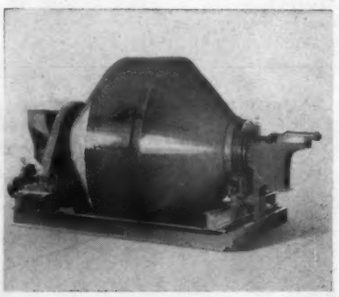
ed in both high level and low level units, the makers say. The probe is integral with the explosion-proof control casing. The entire instrument is mounted as one unit at the point of control desired. The device is said to be acceptable for use with powdered or granular materials, semi-liquids and liquids. The presence or absence of material is detected by the probe through changes occurring in the electrostatic field. A signal is given to the control circuit, which activates a two way fail-safe snap action relay to effect operation of the filling or shutoff device. Additional information may be obtained by checking No. 9333 on the coupon and mailing.

No. 9337—Ammonia Tank Coating

Spatz Paint Industries, Inc. offers a new formula of paint designated as "Spatz Formula M-146" which the makers call an ammonia tank saver. The paint, an epoxidized rubber coating is said to offer unusual resistance to the effect of inorganic chemicals such as anhydrous ammonia, sulphuric and phosphoric acids. The makers say that the paint has great covering power and can be applied with either brush or roller. For complete information check No. 9337 on the coupon and mail.

No. 9331—Rotary Batch Mixers

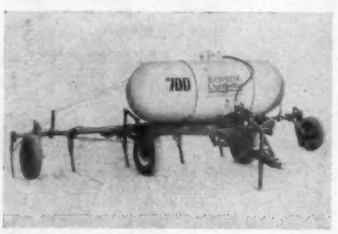
Munson Mill Machinery Co. announces the availability of its new line of larger mixers, which it says means improvements for faster batching cycles. Design changes, according to the makers, include larger intake and discharge ports on the models with capacities from 200 to 360 fpi. Mixers in these sizes also have re-designed trunnion rollers and weight carrying trunnion rings made of Meehanite iron. Munson says these models can also be equipped with internal indicating devices to provide for automatic mixer operations through remote controlled intake and



discharge. This feature is also optional on smaller models, the makers say. For further information on the batch mixer check No. 9331 on the coupon and mail.

No. 9336—Liquid Fertilizer Injector

Dempster Mill Manufacturing Co. has announced a series of new and larger liquid fertilizer applicators with 500 gal. anhydrous ammonia tank or 450 gal. solutions tank. Tanks are mounted on sturdy welded frame carriers and can cover seven 40-inch rows at a time. The tank is also avail-



able in models for dual application with a phosphoric acid tank mounted in front of the NH_3 tank and twin dual drive pumps and in a solutions spray system with 9-row folding nitrogen resistant booms. The makers say that the tool bar is adjustable for both height of shank and pitch of applicator blade. A front end jack for quick hitching of the carrier is also available. For complete information on the applicator, check No. 9336 on the coupon and mail.

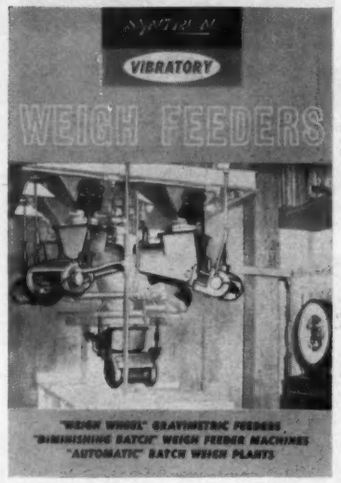
No. 9335—Odor Masking Products

Florasynth Laboratories, Inc., has issued a new perfume catalog containing information of interest to manufacturers of industrial products including insecticides and fertilizers. This section contains a list of "cover odors" to thus give such products greater sales appeal.

Included in the catalog also are other products manufactured by the company. For a copy of the catalog check No. 9335 on the coupon and mail.

No. 9332—Weigh Feeder Machine Catalog

Syntron Co. has announced publication of a new weigh feeder machine catalog. These devices, the company says, are designed for accurate feeding of dry chemicals in the chemical and other processing industries. The catalog also features a new



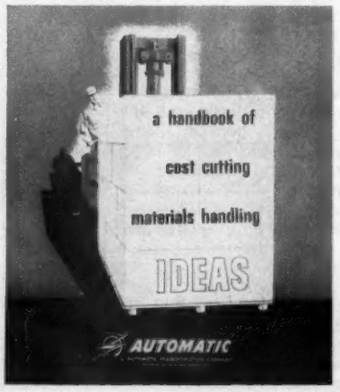
weigh wheel gravimetric feeder and the section also presents data on the company's batch weigh plants for accurate, automatic weighing of multiple batches of various materials where carefully weighed batches must be weighed out to true proportions. The catalog is fully illustrated and gives complete descriptions, data, and specifications for the various weighing devices. Complete information and a copy of the catalog may be obtained by checking No. 9332 on the coupon and mailing.

No. 9315—Dispensing Pumps

Multi-Meter Corp. has introduced a line of drum and pail pumps for easy dispensing of liquid products. One is the Model M-45 pump, which is said to be self-priming and claimed to dispense exactly four ounces a stroke from five and six gallon pails. Small containers can be filled from 5-gallon pails without spilling and waste, according to its makers. The pump is easily installed and adaptable to all size and type pail openings. The Model M-855 pump is designed expressly for use with 15, 30, and 55 gallon drums. It dispenses eight ounces a stroke, eliminates drum racking and may be padlocked to eliminate mis-use of drum contents. For complete information on this item check No. 9315 on the coupon.

No. 9325—Materials Handling Ideas

Automatic Transportation Co. has compiled a new 80 page "Handbook of Cost Cutting Materials Handling Ideas." The handbook contains discussions of current materials handling problems, giving pros and cons



of subjects such as narrow versus wide dials, walkies vs. rider type trucks, specials versus standard trucks, further discussions on pallets, how to select the right truck for a job, how to analyze material handling in the plant. Full information is available in the handbook, which

Send me information on the items marked:

- ☐ No. 9315—Dispensing Pumps
- ☐ No. 9325—Materials Handling Ideas
- ☐ No. 9331—Rotary Batch Mixers
- ☐ No. 9332—Weigh Feeder Machine
- ☐ No. 9333—Level Control Indicator
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- ☐ No. 9335—Odor Masking Products
- ☐ No. 9336—Liquid Fertilizer Injector
- ☐ No. 9337—Ammonia Tank Coating
- ☐ No. 9338—Bag Handling Tips
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- ☐ No. 9341—Screw Conveyor Guide
- ☐ No. 9343—Bag Filling Machine

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can be obtained by checking No. 9325 on the coupon and mailing.

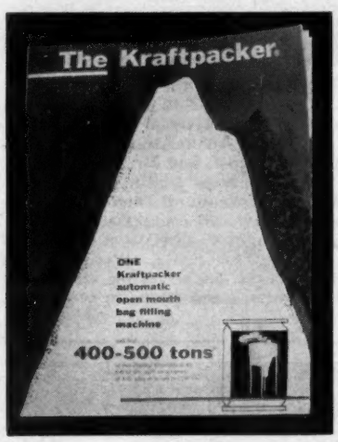
No. 9334—Pesticide Catalog

Hub States Chemical Co. has published a new 56-page catalog of pesticides, completely illustrated with suggestions for mixing and application. Bound in three sections, insecticides, rodenticides and weed killers, the publishers say that the user can find specific chemicals with ease. Copies

of the catalog may be obtained by checking No. 9334 on the coupon and mailing.

No. 9343—Bag Filling Machine

Kraft Bag Corp., multiwall bag manufacturing subsidiary of Gilman Paper Co., has issued a new eight-



page brochure on the subject of the Kraftpacker — an automatic, open mouth bag filling machine.

The company claims that the Kraftpacker will bag 400 to 500 tons of free-flowing materials in an eight hour day, with an accuracy of 4 oz. plus or minus per 100 lb.

This brochure combines Kraftpacker facts with photographic proof of its efficiency in operation, says the company. There are actual installation shots in packaging chemicals, feeds, fertilizers and specialty products. Also illustrated are the portable Kraftpacker and the double-duty twin-scale Kraftpacker.

For a copy of the brochure, check No. 9343 on the coupon and mail.

No. 9341—Screw Conveyor Guide

The Thomas screw conveyor engineering guide, 150 informative pages, is now available to personnel who use or specify screw conveyor equipment.

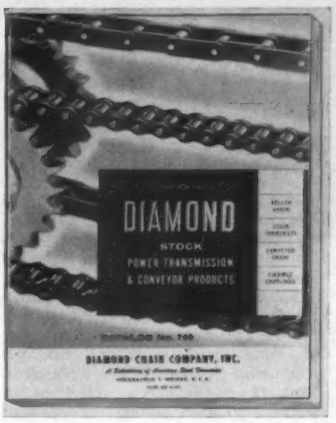
The guide contains several pages showing typical installations of screw conveyors. Three chart and art-filled sections on engineering, components and layouts cover the 83-page center spread. Final portion of this guide shows additional products which Thomas manufactures, a part number index, a general index and some of the facilities of the 91,000 sq. ft. Thomas plant. For a copy of this guide, check No. 9341 on the coupon and mail.

No. 9338—Bag Handling Tips

Union Bag-Camp Paper Corp. has issued a 4-page booklet entitled "Tested Tips on Multiwall Bags" for the storage and handling of the type of bags used for packaging fertilizers and pesticides. The tips cover areas of storing, sewing, and handling. Instructions are given as to proper temperatures and humidities for optimum storage conditions, and tips are also presented on practical methods of introducing moisture into air where it is needed. The tips are illustrated by helpful cartoons and numerous "do's and don'ts" are presented for handling filled multiwall bags. Copies of the 4-page brochure are available by checking No. 9338 on the coupon and mailing.

No. 9339—Roller Chain Catalog

Diamond Chain Company, Inc. has issued a new catalog depicting and describing its stock roller chain, sprocket and couplings. It announces the new higher horsepower ratings for roller chain which it says gives the roller chain now a broader range of applications because of greater loads to be transmitted at higher speeds. In addition to the new "760" catalog, engineering data is given on stock roller chain and sprockets, along with full information on the firm's new products in the power transmission and conveying field.



Copies of the new Diamond "760" stock roller chain, sprocket and coupling catalog are available by checking No. 9339 on the coupon and mailing.

Texas Fertilizer Conference Discusses Responsibility for Servicing Industry

LUBBOCK, TEXAS — Responsibility of servicing the rapidly expanding farm chemicals industry belongs to bankers, producer organizations, state and federal extension specialists as well as dealers, speakers agreed at the 8th annual Agricultural Chemicals Conference held here Feb. 15-16 on the Texas Tech campus.

More than 200 persons representing all facets of the industry registered for the two-day meeting where speakers emphasized servicing agricultural chemicals in west Texas agriculture. Reports on research activities important to high plains farmers highlighted the conference.

Careful use of fertilizers and insecticides pays greater dividends to farmers than over application of either, speakers agreed during the first day sessions.

Increasing dosage of toxicants in hopes of increasing insecticide effectiveness merely causes the point of diminishing returns to be reached almost as soon as the recommended dosages are exceeded, Dr. Ellis Huddleston, Texas Tech entomologist, reported.

Norman E. Foster, chief chemist of the Food and Drug Administration's Dallas office, advised conferees to insist that farm chemicals customers follow label instruction strictly to avoid trouble with the FDA.

FDA checking on farm chemicals use in this region has been bolstered by the establishment of a new laboratory in Dallas, he said.

Reporting on foliar fertilization research in Texas, Dr. A. G. Caldwell, soil chemist at Texas A&M, noted that "foliar fertilization is quite effective when small amounts of a nutrient are required—such as minor elements—and where the treatment can be added to an already existing spray program."

"Under special conditions," he said, "foliar application may save a crop because of its fast action. Plains cotton growers can apply nitrogen late in the season when they see it is needed to get extra production."

Disadvantages include: lack of compatibility of some fertilizers with pesticide sprays, need for repeated applications, and risk of burning the crop and short term effect, Dr. Caldwell added.

Dr. Donald Longenecker, associate agronomist at the Texas Agricultural Experiment Station at El Paso, pointed up possible uses of sulfuric acid on high plains soils.

More investigation and evaluation is needed to determine all possible results of sulfuric acid to obtain phosphorus availability and water permeability in this region.

"Aside from its use in reclamation of sodium-affected soils, sulfuric acid, with proper research, may prove beneficial in rendering soil phosphates more soluble, and alleviating magnesium deficiencies," he said.

Because of the chemical action on primary soil minerals by sulfuric acid, it may increase availability of important trace minerals. It may also be beneficial to increasing acidity in the alkaline soils of the Texas-Oklahoma Panhandle.

"Continued application of H_2SO_4 in irrigation water has been shown to reduce crusting and clodding in the soil surface. This improves workability, and aids germination and emergence of small-seeded crops," he said. "More research is needed in all of these areas, however."

"Fertilizer Placement Research" was the topic of E. D. Hudspeth, Jr., USDA agricultural engineer at the Southwestern Great Plains Field Station at Bushland. He suggested that improper placement of farm chemicals has been limiting fertilizer responses, pointing out that when soil moisture conditions were favorable for germination, a combination nitrogen - phosphorus fertilizer applied one inch below and one inch to the side of seed at planting will increase the rate of seedling growth of Plains bristlegrass.

"Servicing Agricultural Chemicals —Whose Responsibility?" was the question faced by a panel of speakers

Turn to **CONFERENCE** page 37

FARM CHEMICALS CONFERENCE—Speakers at the 8th annual Agricultural Chemicals Conference in Lubbock, Texas, Feb. 15-16 included (from left): Dennis Lilly, vice president for agriculture, First National Bank, Brownfield, Texas; Norman E. Foster, Food and Drug Administration chemist, Dallas; Dr. Ellis Huddleston, Texas Tech entomologist, and Dr. A. G. Caldwell, Texas A&M soil chemist. Below, group discusses fertility of cotton. Future of this crop is dependent on good use of agricultural chemicals from plant to harvesting, according to Raymond King (seated center) at the conference. Looking on is George Pfeiffenberger (left), of Plains Cotton Growers, Inc.; Don Anderson, Crosbyton, Texas, farmer; Don Spain, Olton, Texas, chemicals dealer, and Clay Henry, Floydada, Texas, banker. They discussed the responsibility of bankers, producer organizations and others in servicing the agricultural chemicals industry.

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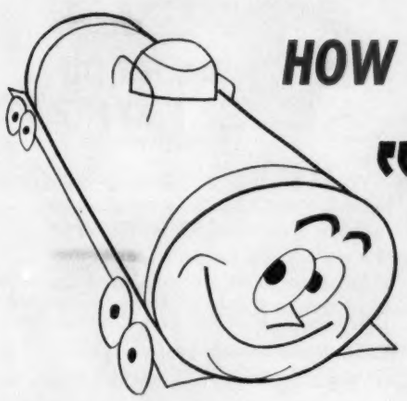


HOW YOU CAN HELP TO...

"GET ME TO YOUR PLANT ON TIME!"

This tank car makes an important point—*extra* important to you now that the rush season is here! As you know, Nitrogen Division produces a full range of nitrogen solutions in ample volume at strategic locations—more than enough to meet normal and peak demands. Moreover, the tank car fleet to transport this production is large enough to handle just about every situation. However, through combinations of circumstances, such as bad weather and emergency orders, it sometimes happens that tank cars are unavailable when wanted, and shipments are delayed. While no one can do anything to alter these circumstances, mixed goods producers *can* take that most important preventive measure: *fast turn-around* of tank cars. Or, as our little tank car character would say:

Everyone benefits where there is fast turn-around at both ends of the track. Nitrogen Division, as producer, can coordinate production and shipment better; while you, as consumer, can handle your peak demands more effiiciently. But it's obvious that a tank car shortage hits mixed fertilizer producers hardest. That's why you should resolve to return tank cars as fast as possible.

"CAN'T DELIVER WHEN I'M IDLE"

Remember, a tank car sitting idle on your siding—or anyone else's—can't also be back at the Nitrogen Division plant, taking on that rush order you just placed!

Here are six practical suggestions, gathered from a wide range of fertilizer plants throughout the U.S., that

can help speed up turn-around of tank cars—and contribute to smoother operations in your plant, in the bargain.

❶ "KEEP ACCURATE RECORDS"

An accurate, running record of withdrawals from tank cars should be maintained at all times. This accomplishes the two-fold purpose of helping to control fertilizer analysis, and determining the instant a car is actually empty.

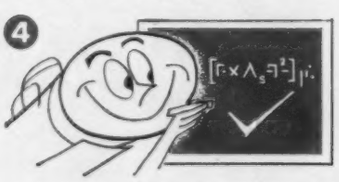
❷ "KEEP AIR PRESSURE UP"

Where a tank car is to be unloaded into a storage tank, maintain enough air pressure to make the transfer quickly. Check piping, pressure gauges, pressure governors, safety devices, and all other equipment for any bottlenecks or malfunctioning. Stay within the limits of permissible working pressures on tank cars and storage tanks. When some pressure relief valves operate, they may drop the pressure below a satisfactory working level, and valuable time can be lost while pressure is being rebuilt.

❸ "WATCH THOSE CENTRIFUGAL PUMPS"

If centrifugal pumps are used to transfer nitrogen solutions to storage, be sure to operate at the minimum practical pressure at the pump's discharge side. This type of pump delivers a great volume at low discharge pressures, but volume drops off rapidly as the pressure increases. For example, in many conventional centrifugal pumps, delivery volume actually drops to zero at fairly moderate discharge pressures.

❹ "MIX HIGH 'N' GRADES FIRST"



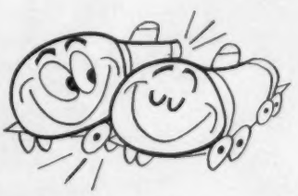
Where conditions permit, operators can empty tank cars faster by giving production priority to those grades which use up solutions rapidly. These include grades that consume large amounts of nitrogen solutions per ton; and those which use moderate amounts, but are mixed quite quickly. Another suggestion would be to have the simpler formulas mixed by less skilled work shifts, such as the night crew, rather than let the tank car sit idle very long waiting for a highly trained crew to start on a complicated mix.

❺ "AIM FOR THE NEXT PICK-UP"

If it can be arranged, it pays to push production a little beyond normal operating pace or hours, in order to empty a car for the next railroad pickup. Where this gets a car rolling over a week-end—so much the better! Your tracks are freed for action, and the possibility of any "salting out" problem is avoided.

IMPORTANT! *Mail your car release notice promptly,* so that Nitrogen Division can expedite the return of the car.

❻ "SOMETIMES TEAMWORK'S BETTER"



Some operators will, on occasion, empty out two cars simultaneously to prevent any interruptions in production that might delay workmen. Of course, care must be taken to see that solution does not pass from one car into the other, as this would disturb the accuracy of a running inventory, thus making it impossible to predict when either car will be emptied. As one might expect, there are certain safety hazards in multiple hook-ups, but since these are quite obvious, multiple discharge can be made as safe a procedure as the single car method.

You, yourself, with a little thought on the subject, could undoubtedly come up with more suggestions for effecting fast turn-around of tank cars. If you would like to discuss these with us... or get more information on any aspect of the transportation and use of nitrogen solutions, contact Technical Service, Nitrogen Division, Allied Chemical Corporation, 40 Rector Street, New York 6, N. Y.

Arcadian News for Fertilizer Manufacturers from Nitrogen Division, Allied Chemical

HOW TO MAKE SURE A SOLUTIONS TANK CAR IS COMPLETELY EMPTY

Failure to completely unload all of the nitrogen solutions from a tank car before returning the car to the nitrogen producer can result in serious difficulties for the fertilizer manufacturer.

Even when the fertilizer produced is up to grade, the cost of returning much solution is some times painful and often leads to controversy. The consequences are critical if the solution left in the car is related to under-proportioning, because the error may not come to light until the customer is informed through the routine check of the nitrogen producer.

Failure to use all the solution in the car may result in the production of large amounts of off-grade fertilizer, as well as the closely associated trouble of over-proportioning. In over-proportioning, the accumulation of shortages may cause a shocking predicament, if a running inventory is not used conscientiously. This is especially true when the solution goes through a storage tank.

Some operators show uncanny accuracy in predicting the point at which the tank car will be empty, whether working direct to process or to a tank. This is usually the result of highly-developed operating skills. These men know how many tons should be processed from each tank car or how long it takes to transfer the contents under certain working conditions. They strive for performance within one-half of 1% of mathematical perfection. They know that errors of 1% are cause for concern, especially when the car seems to be empty or is actually empty.

Usually the failure to empty the tank car is due to too little AIR pressure.

Experience may show that 30 pounds gauge pressure per square inch is required, when the tank car is full, to operate at a desired rate. When the tank car arrives, pressure is practically all vapor pressure from ammonia with very little from air. High pressure on arrival may be desirable but it is also deceptive because it is often at, or above, the pressure required for operation. It pays to depend on AIR pressure to get the desired results, rather than ammonia pressure. It is important to have the correct air pressure on the car at all times until it is completely empty.

Very little air pressure may be required to start an adequate flow and some operators see no reason for maintaining much more than this minimum pressure for the entire operation. That's why some cars are returned to nitrogen producers nearly full of solutions, and many half full.

One reason for inadequate air pressure is a limited volume of compressed air. Measuring tanks have a notorious appetite for compressed air, especially when it is necessary to vent off the air to refill them, which is often the case when handling large quantities of solution.

This problem can be avoided by having a measuring tank large enough to provide a "cushion" over the full charge of solution. Another "cushion" can be a separate pressure-safe aluminum or stainless steel tank above the measuring tank, connected with large equalizing pipes and the usual safety devices.

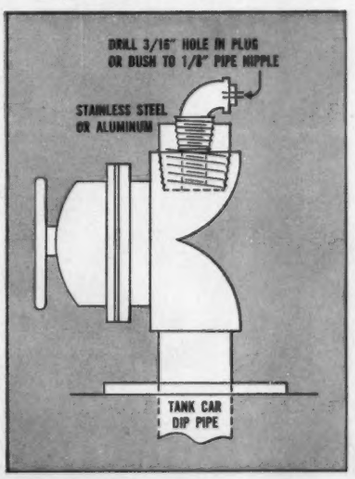
Frequent inspection and easy flushing with water is advised for both tanks. Increased air space may not be a satisfactory answer for the highest vapor pressures. Economy of air here would be in the opposite direction—by using small measuring tanks.

Faulty pressure gauges, absence of any gauge, or improperly placed gauges are other causes for error. But the most common error is the failure to maintain a little MORE air pressure on the car after three-fourths of the solution is removed, right down until the last gallon is removed. Many operators knowingly permit the pressure to decline at this point for reasons that are hard to understand.

A full car has about 3½ pounds more pressure on the solution at the bottom than at the top where the pressure is read. Each two feet of height exerts a pressure of about one pound per square inch. Under a uniform but narrow enough margin of air pressure, the pressure on the solution at the bottom when a low level is reached will be reduced enough that some ammonia will boil out of the nitrogen solution. This level has been as high as the middle of the car and is all too often at the quarter-full level.

During operation this gas volume sometimes creates the same noises, jerking movements of the hose, bubbles in gauge glasses and sight flow indicators and meters, as are created by the rush of air at the instant the car does in fact become empty. There is no easy way of determining whether the emptying symptoms are caused by air or by ammonia gas, if the air pressure is at a questionable point.

The importance of maintaining accurate running records readily available to the operator cannot be over-emphasized. Accurate pressure gauges, to be read only while there is no movement of air or gas past them, are very necessary.



The device shown above is a valve for checking to determine whether a solution tank car is completely empty. The dip pipe goes all the way to the bottom of the inside of the tank car.

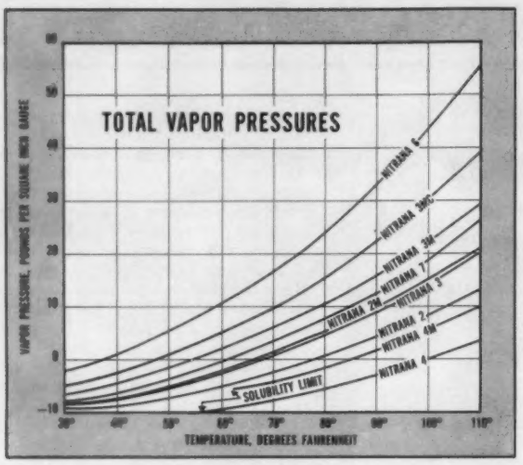
Follow this procedure:

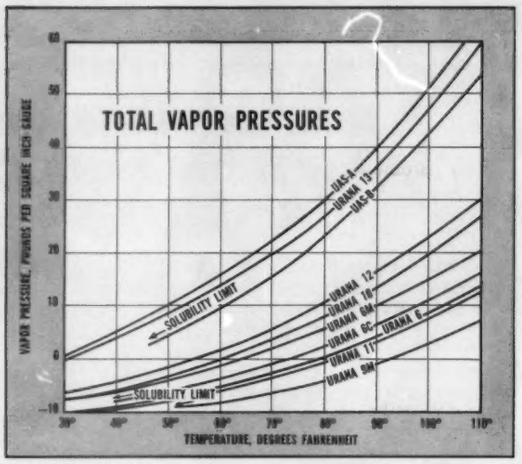
Consult record of car to determine whether it should be empty. Have pressure in car at least 10 pounds above the solution's vapor pressure at its temperature. Observe all pressure limitations and safety practices. See pressure-temperature curve for the particular nitrogen solution.

Open the valve (shown at left) only enough to produce full flow of liquid or gas through the 3/16-inch hole in plug or the 1/8-inch nipple. After 30 seconds, open valve one more full turn to apply full pressure. If full liquid stream flows for the next minute, the car is probably not empty. Consider influence of any liquid drained to car from piping or measuring tank. If air or gas flows freely for the next minute, with pressure as suggested, the car is probably empty.

Note: To avoid removing the solution hose, for the checking, install "T" with a valve ahead of the solution hose. Close this valve while checking to prevent influence of back pressure. Use a small valve on the small test piping. If small hose or much piping is used on test equipment, locate restriction at loose end to insure full pressure being applied at visual observation point.

These suggestions are offered with the belief that they will be helpful to the operator. Because of the many different conditions in fertilizer plants, Nitrogen Division, Allied Chemical Corporation, does not guarantee results from these suggestions.





When the car is three-fourths empty, there seems to be an irresistible temptation to "coast" or use the existing pressure in the car to finish it without adding more air. When sufficient AIR pressure exists at this point no bad results are experienced but the practice gets the operator in trouble eventually.

Sometimes many hours are lost while sufficient air pressure is rebuilt to resume operations. Sometimes much nitrogen solution is returned in the car. Realistically near the end of the car—about 5 pounds more air pressure should be added above the minimum necessary for the full car to compensate for the loss in static head of the liquid to hold the ammonia in solution and out of trouble. Always respect safe practices in general and watch the safety valve settings.

To be entirely free of any concern over pressures that result in return of ammoniating solutions in tank cars, it would be necessary to operate with solutions that have no more than zero gauge pressures. This would lead to some very unsatisfactory ammoniating solutions. Another alternative would be the impractical one of using the existing solutions at temperatures that would naturally provide zero gauge pressures. The temperature-pressure relation tables show that the following temperatures would meet this condition: NITRANA® 6—lower than 38°F... NITRANA 3MC—lower than 48°F... NITRANA 3 and 2M—lower than 68°F... and URANA® 12—lower than 55°F... and U-A-S®—A and B—lower than 30°F.

The more practical way is to understand what causes the trouble and use the correct solution to meet your requirements.

Here are some reasons why the car may be thought to be empty:

In measuring tanks the vent, that releases air so the tank can be recharged, sometimes becomes plugged. This stops the inflow at some short point.

Where the top or the bottom connections of gauge glasses become plugged, the actual flow into the measuring tank is not indicated in the gauge glasses.

Meters may become jammed or the holes in the distributor pipe plugged so no liquid can flow through the meter.

Pressure gauges may be faulty in themselves or poorly placed to lead to wrong conclusions. There may be too little air while the gauge shows ample pressure.

If pumps are used instead of air pressure, they can easily become vapor-locked from ammonia gas and all flow will cease.

Only slightly above normal operating pressures, some centrifugal pumps will abruptly cease to deliver any volume.

In hot weather or in changing to a nitrogen solution which has high vapor pressure, the possibilities of some of the foregoing problems arising are increased.

In extreme cases enough nitrogen salts will be precipitated in cold weather from some nitrogen solutions to plug the system and erroneously indicate that the car is empty.

If you have any questions on the proper handling of nitrogen solutions, contact Nitrogen Division, Allied Chemical Corporation, 40 Rector Street, New York 6, N. Y. Technical advice and assistance are available to customers without charge.

QUESTIONS – ANSWERS

From You — From Experts

QUESTION: In our plant, the production problem centers around preneutralization of nitrogen solution prior to the granulation process. Can you give us some tips on how to overcome this problem?— F. H. Gunnell, manager, Mineral Fertilizer Co., Midvale, Utah.

ANSWER (By Grant C. Marburger, Spencer Chemical Co., Kansas City, Mo.): Since the question does not mention specific phases of preneutralization, this answer will of necessity touch on most of the factors and equipment involved in making full and successful use of preneutralization.

In one typical installation, raw materials are screened into a cluster hopper and weighted into a scale hopper. This mixture in turn is elevated and conveyed to a feeder that meters it into a continuous ammoniator.

From here, the material drops into a dryer and then into a second dryer, which may be used alternately as a cooler, Leaving this vessel, it is elevated into a small cooler, perhaps 5 ft. in diameter by 10 or 15 ft. in length. A double-deck product screen is used at the exit end of the cooler, and oversize particles fall into a chain-mill type crusher and are returned to the screen. Fines are collected in a large recycle hopper from which they are removed and fed into the ammoniator at a controlled rate.

Is your preneutralization equipment itself adequate? Here is a description of a preneutralization tank in one plant where successful operation has been under way for nearly three years. While we would hesitate to say that this equipment is the "only" type, it is true that this has performed well under operating conditions in a commercial plant.

The tank itself has a diameter of 5 ft. and a height of 7 ft. It is constructed of 10 gauge, No. 316 stainless steel. A 3 in. overflow outlet is located 3 ft. from the bottom, and the preneutralization slurry flows by gravity through this 3 in. uninsulated line into the ammoniation section of the ammoniator granulator, located one floor below the tank. The discharge into the ammoniator is made through the open end of the pipe. (Better results probably would be achieved with some arrangement to give better distribution, but as yet it has not been attempted.)

At the bottom of the tank a second 3 in. outlet joins the 3 in. overflow pipe and is used at the end of the run to empty the tank. A 3 in. diaphragm valve controls the rate of flow from this line and a plug is used to open or close this outlet.

The valve originally installed left a gap between the bottom of the tank and the seat of the valve just long enough to fill with slurry and solidify during operation, and this salting out made the valve useless. The plug screws into a coupling welded into the tank at the outlet, and has a handle extending to the top of the tank. A safety overflow is located 4 ft. from the tank bottom. Its purpose is to prevent spilling over the top of the tank should the regular overflow become plugged.

All 3 in. lines were originally installed from carbon steel because of the big cost difference between carbon steel and stainless steel in the 3 in. size range. It has since proven necessary to substitute stainless steel sections at the most corrosive points. (However, costs have been reduced by making pipe out of stainless steel plate. The men arc the plate and then weld it together.)

A hood and exhaust stack, constructed of lumber, is placed over the tank for removal of fumes and vapor. The 24 by 24 in. stack effectively removed fumes by natural convection without the use of a blower. A thermocouple well and a valve for sampling were also included in the tank. Temperatures are taken close to the bottom of the tank near the sparger outlets.

Flow into the tank is made through supply lines that enter at the top and connect to the sparger location on the bottom. One line is for phosphoric acid, one for sulphuric acid, and the third carries a combination of nitrogen solution and water. The sparger arrangement is a series of drilled pipes across the bottom of the tank.

Before preneutralization equipment was added to the plant, flow meters existed for all raw materials. With the addition of the tank, a second flow meter for solutions was added to permit use of ammoniating solutions simultaneously in the tank and in the ammoniator. In addition, all other existing flow meters were valved so that the material could be formulated into either vessel.

Later an extension of two feet was added to the tank height as the simplest method to correct turbulence and splashing in the tank.

From an equipment design viewpoint, one or two other equipment suggestions could be made to improve the preneutralization setup. A flat lid, closing off the tank, could be used with an opening that connected directly to the stack (eliminating the hood), and the mixer would then be installed vertically in the center of the tank lid. An increase in mixer horsepower would also be made, for some grades and formulas create a highly viscous slurry. (A caution should also be added, to make the slurry line as vertical as possible with no horizontal or relatively flat sections. These contribute to excessive surging in the flow of slurry to the ammoniator.) Insulation placed on the slurry line also might help this problem, reducing surging in the flow when dumping the preneutralizer at the end of a run.

Some method of stopping reverse flow in the acid and solution lines to the preneutralizer is needed. For instance, during a momentary shutdown, pressure would be lost on the sulfuric acid tank. If the acid control valve should fail to shut off tight enough and the backflow of acid to the sulfuric acid tank were to siphon slurry out of the preneutralizer, this would solidify and become very difficult to get out. In some cases, check valves have been installed on the acid line. Vacuum breakers might also be practical.

Another suggestion would be to bring the solutions line into the side of the tank instead of from the top. Bringing it in from the side would eliminate the possibility of the ammonia becoming a vapor rather than a liquid, due to its seven-foot heat treatment received by the pipe when coming in from the top. Obviously, when ammonia is released at the sparger as a vapor instead of as a liquid, it is more prone to escape and cause a loss of nitrogen.

The questioner did not mention specifically any difficulty encountered in producing various grades of fertilizer, and in storage problems in connection. Thus, it should be sufficient to say that experience with storing materials of less than 20 units, no more trouble is experienced with preneutralization than was encountered before this process was introduced in plants where records have been maintained on storage properties.

It might be well for the questioner to check his operation methods with those used in plants where a minimum of difficulty has been experienced with preneutralization. Here are some operational facts which might prove helpful:

Water, used as a control of temperature in the preneutralization tanks, should decrease as temperature lowers in the tank, and increase as the temperature rises. Temperature is held in the range of 275° to 300° F.

It is possible to use water as a control of liquid phase in the granulater, but, of course, not all plants do this because the presence of additional moisture with the production of high nitrogen grades, makes difficult the removal of moisture because very little heat can be used in the dryer. Therefore, adding water as a control becomes inadvisable.

At the same time, control must be close, because granulation will of course swing quickly from dry to wet in this operation. Therefore, control must be achieved by the alternate method of controlling fines recycle.

Acidity control is also used extensively. A slurry sample is taken from the tank once or twice a day and analyzed through a pH meter. Acidity will affect the degree of granulation, amount of fumes created, and hygroscopicity in the product pile. For these and other reasons pH samples are used as an overall check of operations.

When starting a production run, water is first added to an approximate depth of 10"; just enough to cover the sparger pipes. Solution and acid, or acids, are then turned on at full rate of feed according to the formula. When the liquid level reaches the overflow, the rest of the plant is turned on.

When the production run is ready to be shut down, the amount of preneutralized slurry in the tank is estimated in order to make the run come out even. Raw material flow to the tank is stopped, and the tank is dumped from the bottom valve and then flushed with water.

At first it may be difficult to gauge the correct rate of flow when dumping the tank through the bottom valve, but with experience it becomes relatively trouble-free.

Management's Good Attitude Basic To Attain Potential of Men, Plant

By David K. Spelt

EVERYONE is keenly aware, it seems, that safety is important. Industrial organizations spend vast sums on safety departments, safety programs and safety contests. They subsidize research and welcome the participation of university scientists. The resultant mass of tables, graphs, "major results," and "implications for future study" is almost frightening to contemplate; but the wrong people seem to do the contemplating, because accidents continue. It is difficult to escape the conclusion that somehow and to some extent we have missed the target.

This suspicion has plagued me for the last few years as a result of a most discouraging experience. Shortly after World War II, I had accepted an opportunity to be part of a research team for what looked like a fascinating job. We were to evaluate, independently and in any way we chose, one of the most extensive and expensive safety educational programs ever undertaken. We had complete files of all the printed material which had been used over a seven-year period. We had the seven sound films which had been available for instruction. We had every freedom to talk to the operational people who had been exposed to the program—and actually did interview 25% of the 4,000 men in the group. We were able to discuss policies and procedures with the men responsible for the teaching and with their supervisors. Finally, we had a mass of information on accidents within the organization which involved the people to whom we talked. The situation looked good, but appearances were deceiving.

I suppose it should be said in somebody's defense that I was at the time a relatively naive college professor, trained in the laboratory and dedicated to the proposition that all projects deserve planning. My return to reality was quick and painful.

It began with the discovery that the home office which sponsored our study was not motivated by anything so abstract as scientific curiosity. Not at all! Their first goal was to find out what was in the two stacks of printed matter—each about three feet deep—which they themselves had issued in seven years! They had done little more than fill a given amount of space, with great regularity, by getting someone to write something about safety.

Naturally they did not know what points had been made, how often a particular emphasis had been repeated, what kinds of illustration had been employed nor any of the other obvious bits of information which it would seem easy to acquire. Under these circumstances, you will hardly be surprised by some of the things we found.

Executives' Attitudes

In this national organization there were very great differences in the seriousness with which local executives took the safety educational program. Some made certain that it was carefully and consistently followed, by wise support of the subordinates who were directly responsible for it. Others allowed their juniors to do whatever they wished, while still others came uncomfortably close to opposing the program actively—supposedly because, as one old-timer said: "Nobody wants to get hurt and if you teach machine operation properly, you've done all you can."

Those differences were clearly reflected in the rank-and-file operating men. Some had carried away from safety sessions a knowledge of principles and facts, a recognition of the kind of situation to which they applied and a determination to make them work. There were some who had a spotty knowledge of the material and found parts of it helpful. There were those who, so far as we could tell, got nothing of any value from the program—they were unable, for example, to identify in any way a single film on safety as one they had seen.

But one important fact was that in all three groups there were men who recognized and commented upon the inequalities of emphasis and presentation which marked the handling of the program in various places, and who put the responsibility for these differences largely on the shoulders of local executives.

This matter of executive attitude is a personal psychological factor, and a crucial one for in-

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EDITOR'S NOTE: Safety doesn't happen—it is the result of long range planning. This is emphasized by Dr. David K. Spelt in the accompanying article. The pattern for good supervision and effective safety programs must be set by top management, he points out. After everything else is done, Dr. Spelt says, "The safety department still has to depend on top management to provide a real concern for safety which operates constantly in a psychologically sound climate of good supervision." The advice in this article is helpful in providing good general management and supervision as well as in establishing a better safety program. The author is a consulting psychologist in Chicago.

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dustrial safety, although its importance is often overlooked.

During the last quarter of a century great progress has been made in the selection and placement of employees. The application of a wide variety of tests has made it possible in many cases to determine who has the qualifications for performing specific jobs well. Research is constantly improving the design of machinery, the placement of control knobs and levers, the arrangement of safety devices, and methods of operation. Paralleling these studies have been others which pointed clearly to the role of emotional disturbances in workmen as a significant contributing cause of accidents. And here we come upon a second personal psychological factor in safety.

Emotion is a disorganizing process; we know that, both from our own daily experience and from psychological research. Fear and anger are upsetting; they interfere with digestion, with breathing, with circulation, with delicate muscular co-ordination, with judgment, with reasoning and even with the interpretation we make of ordinary events around us. The angry man, the worried man, the frustrated man, the insecure man—these are in no condition to give any kind of job the best performance of which they are capable. Particularly, they are unlikely to react well in times of emergency when accurate judgments have to be made very quickly. In a word or two, such men are accident-prone, at least temporarily.

Here, then, are two psychological factors which together play a large part in determining the effectiveness of industrial safety programs: management's attitudes and the worker's emotions. What are the relationships between them?

As we look for some answers let us remember two important, if obvious facts. One we have already suggested: no safety program can succeed which is not genuinely supported by management from the very top down. If "safety first" is a slogan to which top management offers only lip service, nobody else will be fooled; safety men will waste energy and develop ulcers. In this, as in most other respects, management reaps what it sows: "production first, safety second" is a principle which need not be spoken to be communicated.

The other important fact to be remembered is that the emotional problems of employees are often initiated off the job. Marital difficulties, financial troubles, problems with children, even the impact of the general world situation may unsettle any man seriously enough to affect his job performance, and we have to expect that every man will be so affected some time or another.

Management Contribution

It thus becomes apparent that no matter how excellent our employee selection may be, how skillful our equipment design, how thorough our industrial and safety engineering, these are not enough. Safety doesn't happen — not unless management makes its contribution in the way in which it deals with employees. It has to behave in ways which will contribute to good employee morale. In other words, management attitudes must be those which will reduce emotional maladjustment in employees, not those which will increase it.

For every employee, the most important single person in management is his own supervisor. The supervisor's methods and attitudes are management's methods and attitudes for the employee. His day-by-day impact on the men can hardly be exaggerated. What kind of person does he need to be?

First of all, he needs enough intelligence to do the job. But, assuming that he has enough, his way of using it is of paramount importance. He needs some ability to discover the central difficulty in the problems his men face, to know the difference between what is important and what is merely incidental. He ought to be able to bring his own experience to bear on a situation, and yet avoid being inflexibly bound by it. This is sometimes a difficult road to follow, because it is so easy to rely on habit on the one hand and on the other so simple to let each man solve his own problems on the excuse that he will develop more quickly that way. Yet one error destroys initiative and the other destroys the worker's confidence in his supervisor. Both can lead to accidents, for both undermine morale and rob a man's job of the kind of challenge, which keeps him alert and interested. This is a particularly serious problem under current conditions which makes many a job so mechanical that the worker has a difficult time finding a meaningful challenge in it. Secondly, the supervisor needs to be an emotionally mature person himself.

There is much more here than simple freedom from serious psychological disorder, important as that is. It includes a man's ability to meet the real problems of life and determines in large measure how he will behave when the chips are down. The emotionally stable person has an internal standard by which he can evaluate what happens to him and to others. It helps him to stay "on course." It lends a sense of personal security to which others respond and on which they build their own.

The emotionally mature person is unselfish. He is the type of supervisor who finds genuine satisfaction in team successes. He stands up well under the pressure of his job. He rarely loses his temper and provides a steadying influence when others show signs of needing it. Thus he is often able to help his men understand and cope with their own frustrations and disappointments and worries. He can in all these ways contribute materially to the maintenance, in his force, of the kind of calmness that promotes safety by reducing emotional tension.

In the third place, a supervisor must genuinely understand something of human nature. This is perhaps the most troublesome phase of supervisory growth. Everyone thinks he understands human nature, but there are vast differences of the validity of the opinion. There is even a great difference between understanding others and understanding one's self. The most obvious fact about people is that they are different. But many a supervisor tends to measure everyone else by his own standards and his own interests. Such a complete failure to recognize and appreciate what makes other people tick can only lead to trouble.

A good supervisor is far removed from supposing that everyone is or

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"Sell Service", Industry Urged By Speakers at Midwest Meeting

CHICAGO—Representatives of the fertilizer manufacturing industry were given an insight into a banker's attitude toward fertilization and a merchandising talk at the 13th annual meeting of Midwest agronomists with the fertilizer industry at the Edgewater Beach Hotel, Chicago, Feb. 16-17. In addition to the talks mentioned above, agronomists from various state colleges and universities in the area enumerated a number of cropping trends which they said should increase fertilizer consumption in the years ahead. A crowd of more than 700 was in attendance.

A. K. Kindle, representing the merchandising committee of the National Plant Food Institute, sponsor of the event, told the assembly that the fertilizer industry has, within its grasp, opportunities for greater sales and profits if it will recognize and act upon them. These opportunities, Mr. Kindle said, lie in the stimulation of demand for plant food, based on sound agronomic practice and convincing the farmer-customer of his need for plant food. To achieve this end, he said, one must combine "enthusiasm, ingenuity, innovation, integrity, wisdom and hard work . . . together with a healthy determination to sell benefits; the only thing a customer ever buys."

Mr. Kindle described the objectives of the merchandising committee as being to analyze, evaluate and develop ways in which the NPFI's selling aids and programs can best be utilized. "There are opportunities for greater sales and profits everywhere, and we must all reach out for them with every merchandising skill we can acquire." The speaker reviewed a number of localized county soil fertility programs and demonstrations and a number of statewide soil testing drives. These, he said, have proved to be extremely effective and have resulted in many additional tons of fertilizer sales.

Mr. Kindle told the industry members that there are many ways in which the local industry might participate directly and share in the results of improved sales. He listed a number of ways in which such participation might be profitable:

(1) Provide technical assistance to county and state programs. (2) Serve on local committees. (3) Help in the preparation of promotional and publicity materials. (4) Help provide material support such as sampling tubes, sample cartons, posters, stickers and other promotion items. (5) Tie in through your own sales promotion literature. (6) Tie in with your advertising. (7) Sponsor or cooperate in demonstrations. (8) Sponsor special events such as dinners, square dances and sports events. (9) Act as soil test information agent and set up soil sample collection stations. (10) Take soil samples for your customers and prospects. (11) Have your dealers stock recommended grades of fertilizer. (12) Follow up on soil test recommendations and go after the order. That's where your profits lie.

In conclusion, Mr. Kindle told the industry people that opportunities for greater sales and profits can be found "if you want them bad enough. Don't be afraid to do something new and untried. Create demand, then ask for the order—and ask—and ask."

Douglas R. Graves, assistant vice president, Harris Trust & Savings Bank, Chicago, urged the industry people present to talk to their customers about a balanced fertilizer program, rather than just fertilizer sales. He pointed out that in its efforts to increase sales, many fertilizer companies have "carelessly extended large amounts of book credit to farmers. This has resulted in some farmers becoming over-extended and therefore unable to obtain credit from banks."

Mr. Graves added that if a customer is too poor a credit risk for a bank or one of the government credit agencies, it is questionable whether the fertilizer selling agent should assume this risk just for the sake of a sale.

The banker added that if agriculture is to progress, there must be developed a system of financing similar to that found in industry. This type of arrangement will permit farmers to use a line of credit on a revolving basis for year-round financing. Sound planning must be the basis of such credit.

"The fertilizer salesman can do much to help the farmer obtain this type of credit," Mr. Graves said. "If the salesman will assist the farmer in developing a program within his management and financial ability, the banker can be sold."

Agronomists appearing on the program reported on fertility developments in the states of Iowa, Pennsylvania, Kansas, Wisconsin, Ohio and Michigan.

Dr. H. J. Mederski, Ohio State

AT NPFI CONVENTION—Numerous representatives of the fertilizer manufacturing industry turned out for the 13th annual joint meeting of Midwestern agronomists and the fertilizer industry at the Edgewater Beach Hotel, Chicago, in February. In top photo are Paul T. Truitt, left, president of the National Plant Food Institute, Washington, D.C., sponsor of the meeting. With him is Zenas H. Beers, NPFI Midwest regional director, Chicago.

Middle photo: speakers appearing on program of Thursday, Feb. 16, included: (left to right, front row) Dr. Marvin Beatty, University of Wisconsin, Dr. Gordon Ryder, Ohio State University, Dr. John Pesek, Iowa State University and Dr. L. E. Engelbert, University of Wisconsin; (back row) Dr. Everett Rogers, Ohio State University, Dr. H. R. Albrecht, Pennsylvania State University and Dr. M. B. Russell, University of Illinois (chairman).

In lower photo are industry personnel taking part in panel discussion. They are, left to right: H. H. Tucker, Sohio Chemical Co.; R. L. Baiser, Spencer Chemical Co.; Harry L. Cook, Farm Bureau Coop. Assn.; Loren Johnson, U.S. Steel Corp.; R. L. Maxwell, GLF Soil Building Service. Not shown, but participating in the panel was Leonard Schrader, American Oil Co.

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Uniform Policy for Labeling of Plant Food Is Proposed by Midwest Control Officials

CHICAGO—A uniform policy for the labeling of plant foods in the North Central region was discussed and agreed upon by the state control officials and state agronomists from each of the 13 states in the region, at a meeting on Feb. 14, 1961, preceding the 13th annual joint meeting of Midwest agronomists and the fertilizer industry at the Edgewater Beach Hotel. The policy meeting was attended by agronomists and state control officials and by representatives of the fertilizer industry who were guests.

The uniform policy is planned to be ratified by each of the states and appropriate regulations or other action under state laws will be pursued to bring the plan into effect in all states on July 1, 1961, or as soon as possible thereafter, according to the announcement.

The policy itself includes the following points:

1. State officials will require guarantees at minimum levels, in percentages of all available nutrient elements for which claims of beneficial effects to plants are made in any form or manner. The 15 elements and the minimum amount of each which may be guaranteed in the labeling of any plant food product are as follows:

	Per cent	ppm
PRIMARY		
N	1.00	10,000
P	0.40	4,000
K	0.80	8,000
SECONDARY		
Ca	1.00	10,000
Mg	0.50	5,000
S	0.50	5,000
TRACE		
B	0.01	100
Cu	0.01	100
Zn	0.02	200
Mn	0.05	500
Fe	0.10	1,000
Mo	0.001	10
Co	0.001	10
Cl	0.10	1,000
Na	0.10	1,000

An element is considered "available" if the form in which it is added to the product has been shown to give plant responses or if the element can be dissolved from the product in water or in some other solvent which is recognized to indicate availability to plants.

2. Each of the 15 elements, when claimed, is to be guaranteed in the form of the element, except phosphorus and potassium which are to be guaranteed as the element or as the oxide or both. A statement of the equivalent guarantees for phosphorus and potassium as the elements is to be encouraged, but not required.

3. Warning statements are to be required on the label for plant food products which contain more than .025% boron in a water-soluble form.

4. The use of such all-inclusive terms as "balanced" and "complete" in the labeling of plant food products is not to be permitted unless the label shows the intended meaning of the term.

University, reported a shift in farm land use toward a greater percentage of high income cash crops in Ohio. He said that tests made in recent seasons showed that when 150 lb. nitrogen was applied to corn following corn or grain on soils well supplied with phosphate and potash, increases of 30 bu. an acre were realized.

He said that farmers, however, are apparently not conscious of the need for an increased amount of nitrogen when corn follows corn or a non-legume crop. "There is every reason to believe that on many soils, high value cash crops will displace the relatively low value sod crops. With this change, the need for fertilizer nitrogen will increase," he added.

Dr. Floyd W. Smith, Kansas State University, told of tremendous increases in fertilizer use in his state during the past 15 years. Whereas fertilizer consumption in Kansas in 1946-47 was 33,200 tons, use in the year ending June 30, 1960, was 332,861 tons. "At the present time, there is no indication that Kansas fertilizer sales have reached their peak. As a matter of fact, it is entirely possible that annual fertilizer sales may achieve a mark of 400,000 tons by June 30, 1961."

The Kansas agronomist named a number of crops where extra fertilization is indicated, adding that the expansion of irrigation could result in a 50% increase in nitrogen use in the next 15 to 20 years. "It is estimated that about 2 million acres may be under irrigation in Kansas by 1975-80."

How "on the farm" fertilizer trials can convince farmers of the profitable opportunities for plant food use were explained by two Ohio State University specialists, Dr. Gordon J. Ryder, extension agronomist, and Dr. Everett Rogers, agricultural economist. They reported a 42% increase in plant food use by farmers of Miami County, Ohio, last year as a result of a fertilizer demonstration program earlier. This compared with a 3% increase for the state of Ohio during the same period.

The Ohio specialists credited soil testing as a key step in securing a change in farmers' attitudes toward fertilizer use.

The speakers reported that on the basis of soil test analyses in Miami County in the state of Ohio, Miami County farmers at present are using only 36% of the nitrogen, 38% of the phosphate, and 40% of the potash they could apply, if every cropland acre were fertilized according to soil test recommendations.

An increasing number of Iowa farmers on nearly level soils can be expected to adopt continuous corn growing, Dr. John T. Pesek, Iowa State University agronomist, told the group. The main feature of fertilizer needs for continuous corn, he said, is additional nitrogen. "Our most recent estimates show that about 80-120 lb. an acre annually would be needed if corn were grown continuously on soils of average fertility," he said.

The conventioneers were welcomed to the meeting by Zenas H. Beers, Midwest Regional Director of the National Plant Food Institute, whose offices are in Chicago. Dr. M. B. Russell, professor and head of the department of agronomy, University of Illinois, Urbana, presided at the sessions of Thursday, Feb. 16, while Dr. R. L. Cook, professor and head of the department of soil science, Michigan State University, East Lansing, presided at the Friday sessions, Feb. 17.

Chemical Plant Workers Increase During 1960

SAN FRANCISCO — Employment remained almost constant in California's chemical industry during 1960. The Division of Labor Statistics and Research of the State Department of Industrial Relations reports that there were 39,600 wage and salary workers in the chemical industry at the end of 1960, compared with 39,300 12 months earlier.

The Division reported that production workers in agricultural chemicals were earning 9¢ more per hour at the end of 1960 than at the end of 1959. However, average weekly earnings were down slightly due to a shorter work week.

Average hourly earnings for production workers in the agricultural chemical industry were $2.53 in December, 1960, compared to $2.44 a year earlier. The work week dropped from 41½ hours to just short of 40 hours, while the average weekly paycheck was $100.69, 57¢ lower than 1959's.

Israeli Government to Sell Chemical Stock in U.S.

NEW YORK—The Government of Israel's Economic Minister in the United States, Aryeh Manor, and the North American director of the Israel Investment Authority, Shimon Y. Horn, announced that the Government of Israel has decided to sell the majority of government-owned shares in Fertilizers & Chemicals Ltd. to the Israel Investors Corp., an American company registered in the U.S.

This decision was based on an agreement negotiated recently between Samuel Rothberg, president of the Israel Investors Corp. (IIC) and government officials in Jerusalem. IIC will buy the Israeli chemical company's shares acquired from the Government of Israel for its own portfolio and also make them available to the U.S. public. The U.S. investment involved will amount to approximately $10 million.

The Israeli officials termed this a step toward implementing the government's stated policy to sell government-owned industries to private entrepreneurs in Israel and abroad.

NEW PLANT

CENTERVILLE, IOWA — Construction of a fertilizer blending plant by Gro-Mo-Co, Inc., was begun Jan. 16 to be completed the latter part of March. The building will have a storage capacity of 1,200 tons and will serve the farmers in a 30-mile radius. Warren H. McQuarry, manager of the Agricultural Service Co. here, will act as sales agent for the company. Gro-Mo-Co has plants at Blythedale, Mo., and another under construction at Osceola, Iowa. The manager of the new plant has not been announced.

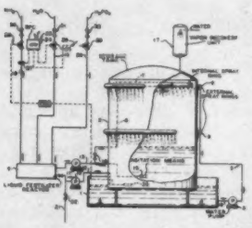
PRODUCTION PROCESS PATENTS

2,970,888

Diammonium Phosphate Production. Patent issued Feb. 7, 1961, to Edward J. Helm and Elwood V. Schulte, Pittsburgh, Pa., assignors to Koppers Co., Inc. A process for the production of diammonium phosphate from the ammonia of coke oven gas containing ammonia and other water soluble constituents, which process comprises washing said gas with water to absorb said ammonia and said other water soluble constituents in said water, steam distilling said water under controlled conditions to separate said other water soluble constituents from said water and under conditions to separate the ammonia from the water in the form of a concentrated relatively pure ammonia vapor, contacting said ammonia vapor with concentrated phosphoric acid at a reduced temperature and acid conditions to produce a slurry of diammonium phosphate having a pH value ranging between about 5.5-8, drying said slurry, and thereafter granulating said dried diammonium phosphate to a desired size.

2,969,280

Process and Apparatus for Producing Cooled Aqueous Ammonium Phosphate Fertilizer. Patent issued Jan. 24, 1961, to Alvin W. Peck, Bartlesville, Okla., assignor to Phillips Petroleum Co.

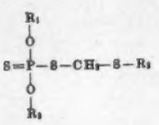


A process for producing a cooled aqueous ammonium phosphate fertilizer comprising separately introducing liquid ammonia, water and phosphoric acid in a first zone and therein mixing these materials whereby the produced aqueous ammonium phosphate becomes heated to a higher temperature than the temperature of the ammonia, water and phosphoric acid prior to mixing, dividing this heated aqueous ammonium phosphate into two portions, flowing one portion down the inner wall of a second zone, flowing cooling water down the outer wall of said second zone in indirect heat exchange with the downflowing aqueous ammonium phosphate whereby the downflowing aqueous ammonium phosphate becomes cooled to a temperature intermediate the temperature of the original ammonia, water and phosphoric acid and said higher temperature, injecting the other portion of said heated aqueous ammonium phosphate into the cooled aqueous ammonium phosphate in said second zone thereby agitating same, further cooling the agitated contents of said second zone by indirect heat exchange with a body of cooling water through the bottom of said second zone, passing a portion of the further cooled, agitated liquid contents of said second zone into said first zone to minimize said higher temperature, regulating the rate of introduction of liquid ammonia into said first zone in response to temperature of the liquid contents of said second zone, regulating the rates of introduction of water and of phosphoric acid into said first zone in predetermined ratios with respect to the introduction of said ammonia into said first zone and withdrawing the remainder of the further cooled, agitated liquid contents of said second zone as product.

2,970,080

Insecticide Formulations. Patent issued Jan. 31, 1961, to Nicholas R. Oros, Trenton, and Richard D. Vartanian, Bound Brook, N.J., assignors to American Cyanamid Co., New York.

A stabilized insecticidal composition comprising a finely-divided solid carrier selected from the group consisting of kaolin clays, montmorillonite clays and attapulgite clays and an organic phosphate insect toxicant selected from the group consisting of those compounds represented by the formula:



wherein R_1, R_2 and R_3 are lower alkyl radicals of not more than 4 carbon atoms and those compounds represented by the formula:

$$Alk\text{-}NHCOCH_2SSP(OCH_3)_2$$

wherein Alk is an alkyl radical selected from the group consisting of methyl, ethyl, n-propyl, i-propyl and t-butyl and an effective amount of a polyalkylene glycol to prevent deactivation of said toxicant by said carrier, said polyalkylene glycol being selected from the group consisting of ethylene glycol, propylene glycol, butylene glycol, diethylene glycol, triethylene glycol and polyethylene glycol and being present to the extent of from about 1 to about 20% based on the weight of the carrier.

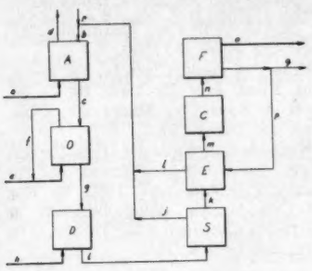
2,971,819

Process for Improving the Quality of Sulfuric Acid. Patent issued Feb. 14, 1961, to Marvin S. Antelman, University City, Mo., assignor to Monsanto Chemical Co., St. Louis, Mo. The method of improving the quality of sulfuric acid containing nitrogen-oxygen compound impurities and having an H_2SO_4 content of not less than 60% which comprises the steps of (1) determining the amount of said impurities in said acid and (2) thereafter passing acetylene in an amount

of from 2 to 500 parts by weight thereof for each part by weight of said impurities in said acid, below the surface of said acid, which is at a temperature of 20° C. to 125° C., for a period of time only sufficient for the acetylene to react with and remove said impurities, the amount of acetylene employed within the said range of 2 to 500 parts by weight being higher at the lower temperatures of said acid and lower at the higher temperatures of said acid.

2,970,039

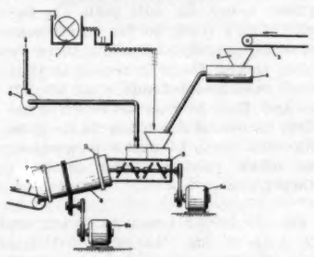
Process for the Production of Ammonium Sulfate. Patent issued Jan. 31, 1961, to Angel Vian-Ortuno and Alicia Crespi-Gonzales, both of Plaza de Salamanca 8, Madrid, Spain. A process of producing ammonium sulfate from sulfur dioxide-containing gas, comprising the steps of passing sulfur dioxide-containing gas through a liquid organic base weaker than ammonia, thereby binding said sulfur



dioxide to said organic base; adding oxygen to the thus-formed sulfite of said organic base so as to substantially completely oxidize the same to the sulfate of said organic base without retaining any appreciable quantity of said sulfite of said organic base; treating said sulfate of said organic base with ammonia, thereby freeing said base and forming ammonium sulfate; and recovering the thus-formed ammonium sulfate.

2,971,831

Manufacture of Superphosphate. Patent issued Feb. 14, 1961, to Yves Martin, Chauny, France, assignor to Compagnie de Saint-Gobain, Paris. A method of making superphosphate having a major proportion of granules between 1.5 and 5 mm. diameter that comprises admitting to a rotating cave tube a sludge of mixed sul-



furic acid and phosphate of fertilizer grade containing proportions of the phosphate and acid producing at least 5-6% of total P_2O_5 insoluble in ammoniacal citrate of ammonia in the final product after aging, advancing and tumbling the reaction mass in the tube, passing cooling air countercurrent through the tube at a rate producing a reaction mass temperature less than 80° C. at the discharge end of the tube, and aging the product for a period of days to a hardness about 1,000 g.

2,971,832

Granulation of Mixed Fertilizers. Patent issued Feb. 14, 1961, to Thomas H. Stewart, Jr., Atlanta, Ga., and Robert A. MacDonald, Highland Park, Ill., assignors to International Minerals & Chemical Corp., Skokie, Ill.

The process of producing a granular mixed fertilizer product of relatively uniform size wherein at least about 90% of the granules of the product are substantially distributed throughout a size range which passes a predetermined maximum mesh size limit (x) within the range of about 4 to about 14 mesh and which are held by a predetermined minimum mesh size limit (y) within the range of about 14 to 35, said mesh range —x +y embracing at least 8 mesh sizes which comprise admixing solid predominantly phosphate and potash fertilizer components to provide a mix having

(a) larger size particles substantially distributed throughout a mesh size range which will pass about (x+2) mesh and be retained on about a (y+7) mesh; and

(b) fine size particles having a maximum size which will pass about a (y+7) mesh:

the larger size particles (a) constituting from about 40% to about 65% of the mixture (a)+(b); introducing into the mix an aqueous ammoniacal solution to produce a completed mixture having a temperature between about 180° F. and about 220° F. which, upon discharge from the mixing step, exits in the form of wetted particles and crumbly aggregates of particles, and removing water from the wetted material while tumbling to produce a granular product in which at least about 90% of the granules are in the desired range.

2,972,522

Sulfur Production. Patent issued Feb. 21, 1961, to Peter Urban, Chicago, Ill., assignor to Universal Oil Products Co., Des Plaines, Ill. The process for converting hydrogen sulfide to sulfur which comprises reacting said hydrogen sulfide with oxygen in a basic nitrogen-compound solution in the presence of a catalyst comprising cobalt histidine.

2,969,303

Combating Insects. Patent issued Jan. 24, 1961, to Roy E. Stansbury and Lyle D. Goodhue, Bartlesville, Okla., assignors to Phillips Petroleum Co. A method of combating an insect which comprises contacting said insect with di-n-butyl sulfone and N-2-ethylhexylbicyclo [2.2.1] -5-heptene-2-dicarboximide, the said compounds being present in concentrations in the range 0.09-0.048 gram of di-n-butyl sulfone and 0.24-0.36 gram of N-2-ethylhexylbicyclo [2.2.1]-5-heptene-2-dicarboximide in 12 cc. of solution, respectively.

Industry Trade Marks

The following trade marks were published in the Official Gazette of the U.S. Patent Office in compliance with section 12 (a) of the Trademark Act of 1946. Notice of opposition under section 13 may be filed within 30 days of publication in the Gazette. (See Rules 20.1 to 20.5.) As provided by Section 31 of the act, a fee of $25 must accompany each notice of opposition.

Pax Snap Bak, in capital letters, for combination weed killer and soil conditioner. Filed March 18, 1960, by Utah Cooperative Assn., doing business as Pax Co., Salt Lake City, Utah. First use Dec. 7, 1959.

Lawn House, in capital letters, for fertilizers. Filed May 24, 1960, by Missouri Farmers Assn., Inc., Columbia, Mo. First use Feb. 25, 1960.

Design, with word "Coastal" on flag in center, for fertilizers. Filed July 12, 1960, by Coastal Chemical Corp., Yazoo City, Miss. First use June 27, 1960; Nov. 14, 1957, as to "Coastal."

Cyanamid, the word within elongated oval, for insecticides. Filed Sept. 16, 1960, by American Cyanamid Co., New York. First use approximately June, 1957.

Whitefrost, in heavy capital letters, for cotton defoliant dust. Filed Dec. 14, 1959, by Hayes-Sammons Chemical Co., Mission, Texas. First use Sept. 7, 1959.

Prime, in capital letters, for insecticide. Filed Feb. 1, 1960, by Cook Chemical Co., Kansas City, Mo. First use Dec. 1, 1959.

Pax Action, in capital letters, for crab grass killer. Filed March 18, 1960, by Utah Cooperative Assn., doing business as Pax Co., Salt Lake City, Utah. First use Dec. 7, 1959.

Pax Punch, in capital letters, for insecticide. Filed March 18, 1960, by Utah Cooperative Assn., doing business as Pax Co., Salt Lake City, Utah. First use Dec. 7, 1959.

Design with letter "M" featured. For agricultural chemicals including nematocidal and insecticidal compositions employed in the treatment of seeds, soil and turf and as space fumigants; animal repellents and other industrial products. Filed June 13, 1960, by Morton Chemical Co., Chicago Ill. First use on or about Sept. 4, 1958.

Vidden, in capital letters, for soil fumigant. Filed Sept. 14, 1959, by the Dow Chemical Co., Midland, Mich. First use July 20, 1959.

Tippon, in capital letters, for herbicide. Filed Sept. 14, 1959, by the Dow Chemical Co., Midland, Mich. First use July 20, 1959.

DDI, in capital letters, for deodorant-disinfectant-insecticide composition. Filed Jan. 20, 1960, by Fuld Brothers, Inc., doing business as Just Distributors, Inc., Baltimore, Md. First use Nov. 2, 1959.

Cuvan, in capital letters, for dry Bordeaux mixture. Filed Feb. 9, 1960, by R. T. Vanderbilt Co., Inc., New York. First use Jan. 8, 1960.

Felco, in hand-drawn letters, for seed inoculants, soil and grain fumigants, fungicides, insecticides, herbicides and anthelmintics. Filed June 14, 1960, by Farmers Elevator Service Co., Ft. Dodge, Iowa. First use, April, 1950.

Dusta-Cide, in hand-drawn letters, for insecticidal dust. Filed Aug. 17, 1959, by the Weevil-Cide Co., Kansas City, Mo. First use May 12, 1952.

Nurelle, in hand-drawn letters, for organic phosphorus product and formulations thereof, said product being useful as a parasiticide, especially as an insecticide and as an active ingredient of veterinary drugs. Filed Sept. 14, 1959, by the Dow Chemical Co., Midland, Mich. First use July 20, 1959.

Germain's, in capital letters, for lawn and garden fertilizer. Filed April 29, 1960, by Germain's, Inc., Los Angeles, Cal. First use Feb. 2, 1960.

Sinclair, within circle for anhydrous ammonia and various chemicals used in the automotive industry. Filed May 8, 1959, by Sinclair Refining Co., New York. First use March 23, 1959.

Pandrinox, in capital letters, for fungicidal-insecticidal composition used in the treatment of seeds. Filed June 8, 1960, by Morton Chemical Co., Chicago. First use on or about Jan. 19, 1960.

FSR, in capital letters, for fertilizers. Filed March 24, 1960, by F. S. Royster Guano Co., Norfolk, Va. First use September, 1959.

Robertson's Gold Nugget Pelletized, in hand-drawn letters on circle, for fertilizer. Filed May 4, 1960, by Robertson Chemical Corp., Norfolk, Va. First use, 1959.

Gold Dollar Plus Brand, with large dollar mark in center, for fertilizer. Filed May 4, 1960, by Robertson Chemical Corp., Norfolk, Va. First use, 1930.

SOK, in capital letters, for crabgrass herbicide. Filed March 24, 1960, by The Upjohn Co., Kalamazoo, Mich. First use Feb. 18, 1960.

Commando, in capital letters, for insect repellent. Filed Ju'y 8, 1960, by M.F.A. Oil Co., Columbia, Mo. First use June 15, 1960.

Erase, in capital letters, for herbicide. Filed July 15, 1960, by O. M. Scott & Sons Co., Marysville, Ohio. First use July 8, 1960.

Nutri-Sol, in capital letters, for fertilizer consisting of a liquid diet for plants. Filed Jan. 14, 1960, by Rex De Ore McDill, doing business as Nutri-Sol Chemical Co., Tampa, Fla. First use Dec. 6, 1951.

FUEL FOR FIRE ANTS

GULFPORT, MISS.—Laboratory tests with imported fire ants showed they would readily take a large variety of foods including fats, proteins and carbohydrates, according to C. S. Lofgren, USDA entomologist at Gulfport. All of the foods which were most preferred contained liquids, and dry foods were unattractive, he explained.

Mr. Lofgren told a group of entomologists attending the Southeastern Branch Entomological Society meeting at Mobile, Ala., recently that field tests with new toxic baits showed that various mixtures of vegetable or fish oils and flours, meals or dried blood were taken very readily by the ants in the field.

Tests with dye incorporated in the food showed that within 24 hours 50 to 86% of the worker ants would have dye in their intestinal tract, thus indicating the good acceptance of these baits, he said.

In tests with toxic baits the following baits gave over 90% control of imported fire ants on small plots: Peanut meal and peanut oil; peanut oil and monoglyceride; peanut butter; peanut oil, soybean oil or cottonseed oil with white flour.

MANAGEMENT'S ATTITUDE

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ought to be his image. He has learned to understand the variety of feelings and attitudes which others display. He recognizes that their motives are likely to differ in important ways from his own. And he can use their motives as a means of encouraging their growth and development.

This important aspect of good supervision is profoundly influenced by the degree to which the supervisor understands himself. Unless he knows what are his own characteristics, unless he is clearly aware of the impact he has upon others, his over-all influence is likely to be meager. He needs to recognize his own assets and his own limitations. He needs a realistic evaluation of his own ability. And he is fortunate if he can add an ability to act on his own to overcome his limitations. All this might be regarded as the background for developing supervisory skills. Only a man who has reached a mature stage of growth in these three respects is likely to make the grade in any management role over the long haul, for it is out of this matrix that the ability to supervise others emerges.

It is precisely in the daily contacts with his men that the supervisor promotes safety or encourages accidents. What kind of person must he be if he is to keep morale high and injuries low?

He ought to exemplify a sound philosophy of organization. His ways of handling his job should make it abundantly clear that he recognizes that the successful business rests fundamentally on cooperation. He will welcome suggestions and sound criticisms. He will carefully give credit when and where it is due. He will recognize that any growing organization changes, and that just as the new ideas have to be evaluated, so do the old established methods and procedures. He will see the organization chart for what it is, a convenient memory aid, and to do his thinking not in terms of rectangles and lines but in terms of people and functions.

He will understand the importance of encouraging his men to grow, hence he will plan his department's work so far as circumstances permit and train them to plan theirs. He will see to it that each man understands what his job is and that he has as much freedom as conditions allow to do it in his own way, to make judgments, to make mistakes and to learn therefrom.

He will help his men to understand the goals of the total organization as well as of their own department. He will exhibit the kind of intelligent loyalty which seeks the good of the organization by giving it the benefit of his best efforts and his best experience. He will encourage the same kind of loyalty in his subordinates.

Fair and Just

At whatever cost, he will be fair and just. His men will know that he understands their point of view regardless of whether he agrees with it

or not. He will not surrender the leadership of his group, but neither will he try to exert an autocratic authority. It is to such a man that workmen will tell their troubles, of course, and listening will occupy a considerable part of his time. But the mere telling of trouble reduces its effect somewhat and telling to an understanding person who may be able to help can accomplish much more.

If this were all that happened in this kind of situation it would have important consequences for morale and safety. But it isn't all. For to this kind of supervisor workers also bring their ideas, their loyalty, their confidence. The place of work becomes a place where important measures of life's reward are gained; and the tensions, the anxieties, the distractions which interfere with performance and interfere with safety are reduced to a minimum.

Now, however, we have come to full circle. For the kind of supervision about which we are talking, which makes such a significant contribution to safety, cannot begin with the foreman or the garage superintendent or the office manager.

If psychological study of management shows anything, it provides abundant evidence that the pattern is set at the top. Top management will get the kind of supervision it wants—the kind it wants earnestly enough and constantly enough to exemplify it themselves. That includes safety programs. The operating personnel in the study mentioned at the beginning of this paper knew where their responsibility lay. Sooner or later they always find out.

Any industry which wants a safe operation can have it. But after selection devices and engineers and physicians have been brought to the aid of the safety department, that department still has to depend upon top management to provide a real concern for safety which operates constantly in a psychologically sound climate of good supervision. This is neither easy nor cheap, but safety always costs less than accidents—and safety doesn't happen; it is the result of careful, long-range planning.

CONFERENCE

Continued from page 24

representing institutions important to progressive farmers.

Clay Henry, Floydada, banker, said a banker should be prepared to encourage farmers to have their soil tested, be aware of harmful insect signs, and thereby protect their investment with pesticides, and urge them to get the best information about fertilizers and services available.

Producer organizations support research for better crops and encourage their members to follow good extension-advised farm practices regarding farm chemicals, said George W. Pfeiffenberger, executive vice president of the Plains Cotton Growers, Inc. "But they can also serve the industry by representing its chemicals-using members before legislative and regulatory agencies — explaining the problems involved in use of farm chemicals," he added.

Cottonseed crushing industry leaders are interested in meeting and working with all segments of the farm chemicals industry, said Raymond King of Lubbock Cotton Oil Co. "The chemical content of the seed, as well as the yield and purity, is important to the seed oil industry," he noted.

A farm chemical dealer has to be ready to deliver the right information and service when the farmer needs it, said Don Spain, owner of Olton Farm Supply, Olton, Texas. He must also report to the manufacturers both the good and the bad results of their chemicals in the field, if he is to be truly responsible, he added.

Chase Bag Co. Realigns Management Personnel

NEW YORK—The board of directors of the Chase Bag Co. has announced a realignment of the company's management. Eight Chase executives were named to new posts.

As a result of the move, Francis H. Ludington becomes board chairman and chief executive officer. He previously was president—a position he held since 1934.

Succeeding him as president is Elliot K. Ludington, Jr., who formerly was executive vice president.

New executive vice president is Francis H. Ludington, Jr., formerly vice president and treasurer, and, before that, vice president in charge of production.

William N. Brock, formerly vice president—director of sales, assumes the post of vice president and assistant to the president.

Richard H. Ayers becomes vice president—director of sales, succeeding Mr. Brock. He previously was vice president—Paper Bag Division.

John A. Book, formerly vice president—director of labor relations, was named vice president in charge of manufacturing. William Hirst, Jr., formerly controller, becomes treasurer. Joseph H. Kuhr, Jr., succeeds Mr. Hirst as controller.

HERCULES DIVIDENDS

WILMINGTON, DEL. — Hercules Powder Co. has reported 1960 net sales and operating income of $336,905,000—as compared to $283,650,000 for 1959. A net income of $27,165,000 was shown in Hercules' 1960 annual report to stockholders. After payment of dividends on preferred and Class A stock, this is equal to $3.05 a share of common stock. Dividends paid in the past year, the report shows, amounted to $1.30 a share, same as in the previous year.

New Distribution Center Established In Iowa

COLUMBUS JUNCTION, IOWA—A new fertilizer distribution center has opened here to sell anhydrous ammonia, liquid mixed fertilizers in bulk, and other agricultural chemicals. The firm is owned by Charles Sparrow, and the plant is operated by Earl Stoller.

The company will also handle new and used ammonia service applicators, liquid tanks and liquid cattle feed supplements.

To Tech Service Post

ATLANTA, GA. — U.S. Phosphoric Products, Division Tennessee Corp., has announced expansion of its technical service with the appointment of Owen A. Niles, Jr., as technical service representative. He will serve the New England and mid-Atlantic states and will live near Baltimore.

AT SOUTHERN WEED MEETING—Pictured at the recent 14th annual meeting of the Southern Weed Conference at St. Petersburg, Fla., are some of the speakers appearing on the program. In top photo, left to right, are Dr. E. G. Rodgers, representing Dean Marvin A. Brooker, College of Agriculture, University of Florida, Gainesville, Fla.; Dr. David W. Staneforth, Iowa State University, Ames, Iowa; Dr. Dale E. Wolf, E. I. duPont de Nemours & Co., Atlanta, Ga.; Dr. R. A. Darrow, Texas A&M, College Station, Texas; Dr. W. B. Ennis, ARS-USDA, Beltsville, Md., and Dr. P. Y. Burns, Louisiana State University, Baton Rouge, La.

In the lower photo are additional people at the conference. Dr. Walter K. Porter, superintendent of the Delta Branch Experiment Station, Stoneville, Miss., newly-elected president, receives congratulations from Dr. R. A. Darrow, Texas A&M, College Station, Texas, as newly-elected officers for 1961 look on. Left to right: Douglas Boatright, Chipman Chemical Co., Bessemer, Ala., and Dr. Don Davis, Auburn University, Auburn, Ala., members of the executive committee; Dr. Porter; Dr. Darrow; Dr. John T. Holstun, USDA, Stoneville, Miss., vice president, and Dr. R. E. Frans, University of Arkansas, Fayetteville, Ark., secretary-treasurer. Dr. Ellis W. Hauser, USDA, Experiment, Ga., was absent when picture was taken.

Soil Test Techniques Described at Meeting

URBANA, ILL.—About 150 fertilizer manufacturers and their representatives gathered at the University of Illinois on February 2 to hear research results and to learn about Illinois soil properties. University of Illinois agronomists presented the program.

J. C. Laverty in charge of the U. of I. soil testing laboratory, reported that 45 Class A commercial soil testing laboratories and 79 county extension laboratories are now operating in Illinois.

He reported the following improvements are now taking place in soil testing methods:

1. The visual test for acidity is being replaced with a pH test made by an electronic instrument. He stated that this method will cover the entire range from acid to alkaline soils and can be calibrated to give a direct measure of lime requirement. The pH test will also serve as a guide to the form of phosphate to use on individual fields.

2. The photelometer method for testing soils for phosphorus is being introduced. An instrument will reduce human error and permit the introduction of a second phosphorus test. This second test (P_1) will enable the tester to determine the amount of phosphorus in the soil for use by crops during the coming growing season, Mr. Laverty reported. The P_1 test may be used as a guide for applying soluble phosphates. The old phosphorus test (P_2) will still be used as a guide for rock phosphate recommendations.

Mr. Laverty reported that the studies of present recommended method of taking 11 composite samples from a 40 acre field seem to indicate a satisfactory method where treatments, crop history and soil types are uniform.

S. R. Aldrich, extension soils specialist, reported on changes in phosphorus and potassium recommendations. In the future, the suggested treatments for soils will be shown in actual pounds of nutrients rather than in pounds of superphosphate, triple superphosphate, rock phosphate and muriate of potash. With this approach, nutrients can be calculated for any fertilizer rather than only individual fertilizer materials, he said.

Prof. Aldrich also reported that phosphorus and potassium contents of fertilizers will also be reported on an elemental basis as nitrogen is now indicated. He pointed out that P_2O_5 is about 44% phosphorus and K_2O is about 83% potassium. At some future date, fertilizer analysis will show only the elemental basis, but by using a dual listing in educational publications, fertilizer dealers and buyers will get acquainted with this terminology, the speaker declared.

The new P_1 test now in use by Illinois laboratories is not interpreted in terms of high, medium, or low for the soil, but rather with respect to high, medium, or low for specific crops. So a given test might be low for wheat but high for corn or soybeans.

M. P. Britton, U. of I. extension plant pathologist, described the importance of the turf grass industry to fertilizer manufacturers. He reported that there are from 15 to 18 million acres of turf in the U.S., with about half in home lawns and the remainder in parks, school yards, golf courses, cemeteries, airports and industrial grounds. About 15% of the fertilizer sold in 1960 is estimated to be for nonfarm uses.

He reported that 45% of homeowners use fertilizer and the average purchase runs about 51 lb. a year. The total home use of fertilizer added up to about 1,099,968 tons in 1959. Illinois ranks fifth in use of fertilizer for nonfarm use, Mr. Britton reported.

Dave Larson, research assistant, reported on a study of bulk application of fertilizers. The idea was to study the agronomic effects of bulk blends and other broadcast fertilizers.

Two distribution patterns were compared with evenly distributed fertilizers. The first pattern was used to stimulate uneven spreading of a homogenous fertilizer. The other pattern varied the ratio between carrier to simulate incomplete blending or segregation of carriers in spreading.

The tests were carried out on the strongly leached Illinoian glacial till soils with low tests for phosphorus and potassium. This would likely give the most fertilizer response and increase the chances of finding differences due to distribution.

Weather factors, however, were unfavorable for high yields and decreased the chances of yield differences due to the patterns of fertilizer distribution. Two corn experiments in 1959 showed essentially no yield differences due to fertilizer distribution pattern. Although the work is preliminary, it seems that differences due to fertilizer distribution are small under the conditions of these experiments.

Wheat experiments conducted so far showed no important yield differences due to distribution patterns. It appeared that a lack of nitrogen limited response to phosphorus even though rather liberal amounts of nitrogen were applied. Denitrification losses may have been large. Experiments now in progress will be top-dressed with nitrogen in order to eliminate nitrogen deficiency. Two experiments with corn are also planned for 1961.

L. T. Kurtz reported on the efficiency of nitrogen. He pointed out that the forms of nitrogen used directly by crops are not stored permanently in the soil. Yet accurate balance sheets for nitrogen in the soil are almost impossible to prepare.

Winter applications often give re-

sponses comparable to spring application. In five of seven experiments in northern Illinois, nitrogen response was very similar regardless of time of application and kind of nitrogen used. Denitrification losses are likely to be serious on poorly drained soils that are wet for appreciable lengths of time in the spring, Mr. Kurtz concluded.

M. B. Russell, head of the department of agronomy, reported on the activities of the department in relation to proposed changes in the Illinois fertilizer law. He indicated the advantages of a rather simple basic law with many of the operational details handled by administrative order. This would provide greater flexibility to meet changes in future technology than would be the case if the details are part of the law and thus difficult to change.

During the afternoon session, a team of U. of I. agronomists discussed the characteristics of Illinois soils as media for plant growth. These included R. T. Odell, professor of soil pedology; S. W. Melsted, professor of soil chemistry; M. B. Russell, and B. R. Sabey, assistant professor of soil microbiology.

During the business session, the following officers of the Illinois Fertilizer Industry Assn. were elected: John Abbott, Ashkum Fertilizer Co., Ashkum, chairman; R. M. Morehead, Olin Mathieson, St. Louis, vice chairman; Roy B. Nethery, Federal Chemical Co., Danville, secretary, and Harold L. Stangel, Darling Co., East St. Louis, treasurer. Robert E. Weis, Virginia-Carolina Chemical Corp., East St. Louis, past chairman, presided over the business meeting.

Entomologist to Join Alabama Firm April 1

MONTGOMERY, ALA. — Agricultural Chemical Service Co., Montgomery, Ala., has announced that Dr. James W. Rawson, entomologist in cotton insect research at Auburn University, Auburn, Ala., will join the Montgomery firm April 1.

Dr. J. W. Rawson

Dr. Rawson has long been associated with cotton insect control, starting his career nine years ago in the Mississippi Delta. In 1958, he received his Ph.D. in entomology from Texas A&M College, with minors in the fields of zoology and plant pathology.

Upon joining the Auburn staff, Dr. Rawson was successively assistant entomologist, associate entomologist and project leader in research on control of cotton insects, including both field and laboratory investigations.

He has been active in the National Cotton Research Conferences since 1951 and is presently secretary-treasurer of the Alabama association for control of economic pests, as well as being a member of the board of directors. The new appointee is also a member of the Entomological Society of America and has served in a number of responsible positions with ESA in Alabama.

Joins U.S. Borax Sales

LOS ANGELES, CAL.—Ronald W. Davis has been appointed agricultural chemical sales representative for U.S. Borax & Chemical Corp. at Youngstown, Ohio, the company has announced.

Before joining U.S. Borax, Mr. Davis served as sales engineer for a manufacturing firm. He is a graduate of Youngstown University with a B.S. in business administration.

Summers Fertilizer Co. Acquires Maine Facilities

BALTIMORE, MD. — Summers Fertilizer Co., Baltimore, has acquired the manufacturing facilities, inventory and trade name of the Aroostook Hi-Test Fertilizer Co., Presque Isle, Maine, Summers has announced. The Aroostook company was a pioneer in the formulation of double and triple strength mixed fertilizers used on the potato fields of Aroostook County. Its origin goes back to the Higgins Fertilizer Co. established in 1927 when concentrated mixtures were first introduced to Maine farmers. Subsequently, a local group of growers purchased Higgins. The new interests reorganized the company as a farmers' cooperative under the name of Aroostook Hi-Test Fertilizer Co.

The facilities of the Presque Isle plant and office will be operated as the "Hi-Test Division" of the Summers Fertilizer Co., Presque Isle, Maine. The management will remain the same with W. R. Edgecomb, general manager; Harry Trask, sales manager, and G. Noel Currie, plant superintendent.

Summers also has plants at Houlton and Mars Hill, Maine, from which it services its Southern and Central Aroostook County business. The Hi-Test plant will now serve the heavier-consuming North Central area of the country's largest potato growers.

SALES UP; EARNINGS DOWN

NEW YORK, N.Y.—Consolidated net sales of Hooker Chemical Corporation, New York City, totaled $149,820,580 for the company's fiscal year ended Nov. 30, 1960, slightly exceeding the record sales of $149,817,496 for the preceding fiscal year. However, consolidated net income, after provision for Federal and Canadian income taxes, was $12,688,877 in 1960 compared with $13,401,636 in 1959.

PERSONNEL

Continued from page 16

ble for the sales of the company's Mexican subsidiary, Quimica Niagara de Mexico, as well as for its export cotton insecticide business in that country.

In 1958 Mr. Lee became a regional manager at the Greenville, Miss., plant and just prior to his retirement was assistant to the manager of the Agricultural Chemical Department. A graduate of Mississippi State College, he joined the company in 1919 as a cotton entomologist.

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E. C. Whitmore

A. F. G. Raikes

Bemis Advances Three

ST. LOUIS, MO.—Two executives of Bemis Bro. Bag Co. have been named vice presidents and a third was elected a member of the board of directors, it has been announced by Judson Bemis, president.

B. L. Willmore

A. F. G. Raikes, director of eastern operations and E. C. Whitmore, director of product planning, are the new vice presidents, and B. L. Willmore, vice president and director of procurement and materials, is the new board member.

Mr. Willmore became associated with Bemis in 1946 as price economist in the company's general sales department, St. Louis. He served as supervisor of pricing, head of the sales economics section and, in 1958, was elected assistant secretary of the company.

Mr. Raikes joined the company as a sales representative in 1938 and has served as assistant to the director of sales, assistant director of sales, and as manager of the New York general sales division. He was named director of eastern operations in 1959.

Mr. Whitmore joined Bemis three years ago as director of product planning.

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Retires from Bemis Bag

ST. LOUIS, MO.—M. E. Ocker, manager of the Wichita plant and sales division of Bemis Bro. Bag Co. since 1928, retired from the company Feb. 28, after a 50-year career with Bemis.

M. E. Ocker

The retiring manager, a native of Kansas City, Mo., joined Bemis as an office boy in August, 1910. Excluding World War I military duty, with service in France, Mr. Ocker remained in the Kansas City office until 1922, serving in all office positions.

He moved then to Wichita as a salesman and continued in sales work until his appointment as manager of the plant and sales division.

He is succeeded by George W. Finlay, who joined Bemis in 1946. Mr. Finlay was graduated from St. Louis University in 1941 and served as an officer in the U.S. Marine Corps during World War II.

OFFICER DISCUSSION—New officers of the Illinois Fertilizer Industry Assn. talk over plans for the coming year with Sam R. Aldrich (second from left), University of Illinois agronomist, at the recent Illinois fertilizer conference on the university campus, Urbana. Clockwise, left to right, they are: R. M. Morehead, Olin Mathieson Chemical Co., St. Louis, vice chairman; Mr. Aldrich; Harold L. Stangel, Darling Co., treasurer; Roy B. Nethery, Federal Chemical Co., division of Natural Distillers & Chemical Corp., secretary; Robert E. Weis, Virginia-Carolina Chemical Corp., past chairman and direc-

Engineer Joins Ortho

RICHMOND, CAL.—Frank Juchter, vice president and manager of manufacturing for the Ortho Division of California Chemical Co., Richmond, Cal., recently announced the appointment of Robert J. King as administrative assistant to the manager—manufacturing. Mr. King has had over 15 years of service in various Standard Oil Companies.

Mr. King is a graduate of Chicago Teachers College and studied at the Illinois Institute of Technology and the University of California in Berkeley. His graduate studies at these latter institutions were in the fields of engineering and chemistry.

C-Z Advancements

SAN FRANCISCO—Robert F. Gill has been named sales manager for the multiwall bag sales division, Crown Zellerbach Corp. This is a newly created position within the division.

Robert F. Gill

Mr. Gill's promotion is one of four new assignments to be announced by James W. Kincaid, division manager.

In his new position Mr. Gill will direct the division's sales force of 30 men in 17 offices across the nation. His offices will be at San Francisco. Mr. Gill is a nine-year veteran with Crown Zellerbach. His most recent position was national accounts manager for the multiwall bag sales division. He resides in Woodside, Cal., and is an alumnus of Stanford University.

Other multiwall bag sales division promotions announced by Mr. Kincaid are:

Fred H. Bostock as machinery sales manager. Mr. Bostock has had more than 30 years' paper sales and management experience with Crown Zellerbach.

A third promotion was the appointment of Robert W. Minahen as the division's western regional sales manager. In his new assignment Mr. Minahen will direct divisional salesmen in the 11 western states.

Appointment of Donn E. Nissen as San Francisco district sales manager was the fourth promotion. Mr. Nissen will supervise divisional sales activity in the state of Nevada and central and northern California.

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F. S. Royster Advances Five Key Executives

NORFOLK, VA.—F. S. Royster Guano Co. has promoted five of its key executives: Frank S. Moore, vice president in charge of manufacturing, has been named executive vice president, a newly created position; Dr. T. N. (Tex) Gearreald, company treasurer, is now vice president and treasurer; C. G. (Cliff) Baughman, general sales manager, was made vice president; J. Frank George, assistant vice president for manufacturing, was promoted to vice president and A. O. Carroway, company

comptroller, was named vice president.

The action came at the company's annual meeting in Norfolk Feb. 14. Announcement was made by F. S. Royster, Jr., chairman of the board, and Charles F. Burroughs, Jr., president.

Mr. Moore is currently president of the Virginia Manufacturers Assn. and has had a long and active career of civic service in Norfolk and in Virginia. He joined the Royster fertilizer company in July, 1929, and has been a vice president since 1950.

Dr. Gearreald, who holds the Ph.D. degree in agricultural economics from Cornell University, joined Royster in 1954 as credit manager.

Mr. Baughman, a native of Duncan, Miss., joined Royster in 1929 as a salesman. He was promoted through the ranks to general sales manager in 1956.

Mr. George, a native of Norfolk, joined Royster's manufacturing department in 1954. He is a former vice president of the Gary Steel Products Corp.

Mr. Carroway, a native of Snow Hill, N.C., joined Royster in August, 1954. He is a certified public accountant and held various responsible positions before joining Royster.

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Dorr-Oliver Appoints

STAMFORD, CONN.—In a series of personnel re-assignments, Dorr-Oliver, Inc., Stamford, has announced the election of William J. Fox, vice president-domestic operations, to the board of directors, his resignation from the office of secretary of the corporation; the resignation of G. H. Dorr II as treasurer, the election of Rowland C. W. Brown to replace Mr. Fox as secretary, and the appointment of Glen G. Reed, a vice president, to the newly created post of vice president-international division.

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Amoco Appointment

CHICAGO—R. B. Perkins has been appointed manager — sales technical service laboratory of Amoco Chemicals Corp., Laurel G. Parkinson, general manager—marketing, announced recently. Mr. Perkins joined Amoco soon after its organization in 1957. At that time he was instrumental in the formation of the sales technical service laboratory and has been in charge of it since then. The laboratory is located in Chicago.

From 1940 until he came to Amoco Chemicals, Mr. Perkins was with the Texas City laboratory of American Oil Company. From 1935 to 1940 he was chief chemist with the Houston laboratory of the Petroleum Rectifying Co.

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West Virginia Appointment

NEW YORK—West Virginia Pulp & Paper Co. has appointed William A. Breen sales representative for its Multiwall Bag Divison in Buffalo and western New York, and in Pittsburgh and western Pennsylvania, it was announced by R. C. Masoner, district sales manager for the division in Columbus, Ohio.

Mr. Breen joined West Virginia after graduating from Fairleigh Dickinson University with a B.S. degree in business management. Since that time, he has become thoroughly versed in all phases of the multiwall bag business.

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Joins Calchem Co.

RICHMOND, CAL. — William T. Kondo, a graduate student in the department of plant pathology at Washington State University, has recently joined the Ortho Division of the California Chemical Co. in the firm's Central California area as a field research entomologist. The announcement was made by L. R. Gardner, manager of research and development for Ortho. Mr. Kondo is completing his Ph.D. work at Washington State.

Lime Production Up

WASHINGTON — Production of open-market and captive quicklime and hydrated lime exceeded 1 million tons during each of 4 months of 1960 (March, April, May, and October). December, 1960 output of 877,598 short tons of lime was the lowest production during any month of the year, according to reports to the Bureau of Mines, U.S. Department of the Interior, by plants producing 10,000 or more short tons of lime a year. Total open-market and captive lime produced in December, 1960 was 12% below December, 1959 (1,001,314 short tons) and 21% below April, 1960 (1,107,134 short tons), the highest month on record.

According to the monthly canvass, lime production totaled 11,895,318 short tons in 1960, compared to the monthly lime total of 9,310,527 short tons in 1959. Approximately two-thirds of the 1960 total was open-market lime and one-third was captive lime.

New Close-to-Harvest Registration for Systox

KANSAS CITY, MO.—A new registration now permits use of Systox systemic insecticide on tomatoes to within three days of harvest. The registration is effective in the U.S. and Canada.

Systox is used for control of aphids and mites on tomatoes, and has also been used to control aphids, mites and leafhoppers on a variety of vegetables, fruits, nuts, forage crops and ornamentals.

Freeport Launches Record Liquid Sulphur Shipment

NEW YORK — Freeport Sulphur Co. announced on Feb. 28, completion of the largest shipment of liquid sulphur via ocean-going vessel in the history of the industry.

A record 16,100 long tons of molten sulphur was transported by the vessel "Louisiana Sulphur" from Port Sulphur, La., to Tampa, Fla.

The trip marked the inauguration of the coastwise tanker service which is part of a new $23,000,000 program to move the company's sulphur in liquid form into major market areas for storage and transshipment to its customers. Later the carrier will extend its deliveries to terminals up the Atlantic Coast as far north as Bucksport, Maine.

In December, Freeport began barge service on the inland waterways. Terminal locations are at Joliet, Illinois, and Wellsville, Ohio.

AT ARIZONA CONFERENCE—Five speakers featured at the 4th annual Arizona Fertilizer Conference held at the University of Arizona, Tucson, recently, were (left to right): E. O. Foster, Balfour, Guthrie & Co., Ltd. and chairman, Soil Improvement Committee of Arizona Agricultural Chemicals Assn.; L. R. Hamilton, California Chemical Co., Richmond; Dr. Wallace Fuller, head, Department of Agricultural Chemistry and Soils, University of Arizona; Dr. Richard B. Bahme, Western Director, National Plant Food Institute, San Francisco, and Dr. C. O. Stanberry, USDA soil scientist, Tucson.

Arizona Speakers Point Out Import of Communications

TUCSON, ARIZ.—More than 175 growers, fertilizer salesmen and technicians, and college specialists attended the Arizona Fertilizer Conference in Tucson on Feb. 8 and 9.

"Plants and Fertilizers at Work" was the over-all theme of the sessions which were designed to bring 1960 research results in soil fertility and fertilizer programs to the public.

The University of Arizona hosted the fourth annual conference in cooperation with the Arizona Agricultural Chemicals Assn. and the National Plant Food Institute.

A panel discussion titled "Bridging the Gap — Agricultural Communications" pointed to the need for teamwork among all agencies responsible for providing sound fertilizer programs to farmers, according to Dr. R. B. Bahme, panel moderator and Western Director of NPFI.

Henry Schacht, Director of Agricultural Information, University of California and a panel member, remarked that the fertilizer industry has a great responsibility to increase the flow of accurate information to all concerned, such as fertilizer salesmen, colleges, USDA and publications. "Avoid misleading information —stick to the simple facts," he commented.

A need for the fertilizer industry to cooperate in dramatizing and glamorizing information for local adaptation was stressed by Ernie Douglas, editor, "Arizona Farmer Ranchman," also a member of the panel.

Effective agricultural communications require that vital messages be sent in farmer language, according to panel member Joe McClelland, University of Arizona Information Specialist.

L. R. Smith, public relations manager, Collier Carbon & Chemical Corp., spoke at the banquet on "Factual Fertilizer Communications" stressing the importance of two-way communications.

Other roundtable and panel topics were "Delta Pine Cotton—Merits and Demerits," "Plant Nutrition and Water," and "Highlights of 1960 Fertilizer Research."

Dean H. E. Myers, University of Arizona College of Agriculture, presented the National Plant Food Institute student agronomy award to Pedro Orozco.

Dr. Lynn Mellor, agronomist, Olin Mathieson Chemical Corp., served as conference chairman the first day and E. Osborne Foster, Balfour, Guthrie & Co., Ltd., presided over second day activities.

Robert White Retires From Post at Armour

ATLANTA, GA. — Robert White has retired as general manufacturing manager of Armour Agricultural Chemical Co. after 42 years of service, it has been announced by W. E. Shelburne, president of the company.

Mr. White is being retained by the company as a consultant on fertilizer manufacturing operations, Mr. Shelburne said.

Appointed general manufacturing manager for the fertilizer-manufacturing firm in 1955, Mr. White came to Atlanta in 1934 as general superintendent of all of Armour's fertilizer operations. Previously, he was associated with Armour's Baltimore and Carteret fertilizer plants.

Mr. White developed the practical use of ammonia water and anhydrous ammonia in dry fertilizer mixtures, and, under his direction, Armour was one of the first fertilizer manufacturers in the U.S. to produce high-analysis fertilizers using anhydrous ammonia and phosphoric acid.

A native of College Park, Md., Mr. White received a bachelor of science degree from the University of Maryland, where he was awarded the Medal of Excellency in Chemistry. He served as a second lieutenant in the infantry during World War I.

MONSANTO'S SALES RISE

ST. LOUIS, MO.—Monsanto Chemical Company's unaudited consolidated sales for 1960 amounted to $890,500,000, compared to $875,012,000 for 1959, the company has announced. For both years, such sales include those of the parent company and all subsidiaries. Unaudited net income for 1960 from consolidated sales was $67,700,000, a decrease of 9.5% from income of $74,765,000 for 1959.

Increasing Use of Wet Phosphoric Noted at Meeting

NEW ORLEANS — Demand for wet process phosphoric acid for fertilizer is on the increase, according to T. P. Hignett, Tennessee Valley Authority engineer, in a talk before the American Institute of Chemical Engineers at New Orleans, recently. He pointed out that before World War II, annual production was 120,000 tons. After the war, it increased to 400,000 tons annually. In 1958, 1,070,000 tons were produced and the estimated 1960 production was 1,300,000 tons.

His paper, entitled "Manufacture of Wet-Process Phosphoric Acid," said that wet process acid is used principally for fertilizers, whereas that produced by the furnace method is used largely for chemical and food products. Since 1952, production of wet-process phosphoric acid has outstripped furnace produced acid and in 1958, production of the latter was about 400,000 tons less than the wet process.

As the average production increase of wet process acid is about 110,000 tons a year, and several new plants are under construction and plans to build others have been announced, it appears "that the rate of increase is not slacking," he said.

"The increased production of wet-process acid reflects not only the increased demand for phosphate fertilizers but also a change in the type of fertilizer," Mr. Hignett observed. . . ."From 1910 to 1950, 80% or more of the phosphorus in fertilizers was in the form of ordinary superphosphate. . . . Since 1950 there has been a strong trend toward high-analysis granular fertilizers which require concentrated phosphate materials. For this reason, the percentage of phosphatic fertilizer supplied for ordinary phosphate has declined sharply since 1950.

In 1960, ordinary superphosphate constituted only 48% of the phosphatic materials supplied for use in fertilizers. . . . The remaining 52% . . . were principally products made with phosphoric acid . . . "

That the petrochemical industry is expected to produce some 56 billion pounds of chemicals this year, or 30% of the total chemical output of the U.S., was predicted by other speakers at the New Orleans meeting. By 1965, the industry will produce 85 billion pounds, or 40% of all chemicals made in the U.S., Karl J. Nelson, vice president of Enjay Chemical Co., New York, told the group.

"Today, petrochemicals account for approximately 60% of the sales of the chemical and allied products in industry and for well over 50% of its investment in plants and equipment," he said.

ROOT WORM EXPECTED

MANHATTAN, KANSAS — Corn root worm could be the most destructive insect in Kansas in 1961, warns Dell E. Gates, extension specialist in entomology at Kansas State University, Manhattan.

Most of the damage will occur in the northeastern area of Kansas, he says, adding that some corn growers in the area who never before had trouble with corn root worm will have control difficulties. Corn root worm eggs are laid in the soil of corn fields in late summer or early fall. The larvae hatch out in the spring and do damage before their presence is detected.

Maintenance of Bagging Machines to Be Stressed

DETROIT, MICH.—Packaging machinery manufacturers will sponsor a project aimed at lengthening the service life and minimizing the downtime of their machinery in customers' plants.

"Planned Maintenance: The Profit Tool of Modern Management" is the general theme that will be explored during a conference-workshop to be conducted by Packaging Machinery Manufacturers Institute, Inc., in Cobo Hall, Detroit, Nov. 8 and 9.

These preventive maintenance forums will be held in conjunction with the Packaging Machinery Manufacturers Institute Show of 1961. This event occupies Cobo Hall on Nov. 7-10.

The announcement was made by Richard Wellbrock, chairman of the PMMI committee arranging the technical sessions. Mr. Wellbrock is vice president-sales New Jersey Machine Corp., Hoboken.

He reports that the Nov. 8 opening meeting will be an all-morning conference. Speakers will cover various phases of preventive maintenance. Later sessions will be devoted to a workshop program with several groups meeting simultaneously under a number of discussion leaders.

Mr. Wellbrock said the conference-workshop would have specific appeal to engineering-manufacturing-production executives in plants where packaging machinery is in operation.

Monsanto On Stream With Industrial Phosphoric Acid

ST. LOUIS — Monsanto Chemical Co. now is marketing 105% phosphoric acid from its newly completed plant at Addyston.

The product, 40% more concentrated than normal 75% acid, is for use of various industrial and chemical processing industries, according to A. Q. Svoboda, product sales manager for Monsanto's Inorganic Chemicals Division.

IMC Purchases Bioferm Corp. of California

SKOKIE, ILL.—Bioferm Corp. of Wasco, Cal., operating in the field of microbiological fermentation, has been acquired by International Minerals & Chemical Corp., by an exchange of 80,000 shares of IMC stock for all the outstanding shares of Bioferm stock.

Bioferm will operate under IMC's amino division, which manufactures and markets the food-flavor enhancer, "Ac'cent."

Bioferm is a leading producer of vitamin B_{12}, used both as a pharmaceutical and an agricultural feed ingredient. The company also has recently developed a microbial insecticide.

Speaker Sees Annual Loss of $25 Million Caused by Aquatic Weeds in United States

CHICAGO—The annual meeting of the Aquatic Weed Control Society was held in the LaSalle Hotel, Chicago, Ill., on Feb. 14 and 15, 1961. Over 100 applicators, scientists and regulatory delegates from 21 states and Canada met to share current technical information on chemical aquatic weed control and application procedures.

Keynote speaker was Dr. W. B. Ennis, Jr., chief, Crops Protection Research Branch, USDA, Beltsville, Md. He pointed out the cost of the weed problems in the irrigation systems built by the Bureau of Reclamation caused a financial loss of nearly $3 million annually. Projecting these figures to all irrigation systems in 17 western states, he estimated a $25 million annual loss due to aquatic weeds.

A panel discussion on the merits of chemical compounds now being tested and marketed for possible aquatic weed herbicides was presented by representatives of the chemical industry. Represented on this panel was Harrold B. Jones, American Smelting and Refining Co.; Cecil Kerr, Chipman Chemical Co.; Mark Wiltse, Dow Chemical Co.; James Flanagan, Geigy Chemical Co.; Charles Bolster, Pennsalt Chemical Co., and Lyle Hill, Reasor-Hill Chemical Co.

The necessity to develop chemicals which will control the nuisance, be non-toxic to humans and aquatic life, and be economically feasible was the theme of the discussion.

James W. Smith, field landscape architect of the Metropolitan-Huron-Clinton Authority of Detroit, moderated a panel on application procedures and equipment. The fact was brought out that even though an ideal herbicide is available, its peak efficiency can be obtained only through the use of proper equipment and application methods. Members of this panel were: Al Lopinot, Illinois Conservation Dept.; Paul W. Eller, Chipman Chemical Co.; John Gallagher, AmChem Products, Inc.

Kenneth Mackenthum, Wisconsin Water Resources, moderator of a panel that discussed new herbicides now being tested in the field, brought out that some chemicals will need more extensive testing before the herbicide can be recommended for general use.

William C. Hall, Arboreal Associates of New York, said that the need for a persistent algaecide of low toxicity is urgent. Algae in waterways are becoming an increasingly serious problem in fish management, recreation lakes, watersheds, farm ponds, and in general, most any body of fresh water.

The need for close coordination with research, regulatory agencies, commercial spray operators, and industry was brought out by Dr. Frank F. Hooper, Michigan Department of Conservation. He said that the Aquatic Weed Control Society could be very important coordinating the work on the many problems known in the field of aquatic weed and algae control.

Next meeting of the Aquatic Weed Control Society will be held on Feb. 13-14, 1962, in the LaSalle Hotel, Chicago.

Officers elected were: Edward J. Longtin, White Bear Lake, Minn., president; Paul W. Eller, Chipman Chemical Co., first vice president; David Papier, Ohio Department of Wildlife, second vice president, and Kenneth Mackenthun, Madison, Wis., secretary-treasurer.

Elected to the board of directors were: Dr. Duncan McLarty, University of Western Ontario, Canada; Dr. Robert C. Hiltibran, Illinois Natural History Survey; Lyle Hill, Reasor-Hill Co.; Henry P. Carsner, Tacoma, Wash. and Dr. B. Domogalla, Applied Bio-Chemists & Associates.

Allied's Phosphoric Acid Plant Now on Stream in Illinois

NEW YORK — Allied Chemical Corp. has announced production of phosphoric acid from its new facilities located at the East St. Louis, Ill. works of its General Chemical Division.

The plant, with a projected capacity of 50,000 tons per year of high-quality wet process acid, will primarily supply fertilizer manufacturers serving midwest agriculture. General Chemical Division previously furnished a portion of the midwestern area's acid requirements from its plant at North Claymont, Del.

According to the company, the new plant will produce "a truly green wet process acid of finer quality than any previously available." Its quality, the makers say, results from use of new processing techniques together with selected raw materials, including virgin quality sulfuric acid.

Wet process phosphoric acid has been used in liquid fertilizers for the past several years, following pioneering work in the wider application of this economical form of phosphoric acid. The product is also used in granulating and enriching dry, mixed fertilizers which require a higher phosphorus content, as a component of animal feeds, and as a bacteriological nutrient in the disposal of industrial wastes.

General Chemical has long been a producer of basic industrial chemicals including sulfuric acid, some of which is consigned to the production of phosphoric acid. The division has 40 operating plants throughout the United States.

FERTILITY RESEARCH

LUBBOCK, TEXAS — A goal of $12,100 to support area research on soil fertility and use of fertilizers was set here Feb. 16 by the South Plains Soil Fertility Committee.

Meeting in conjunction with the 8th annual Agricultural Chemicals Conference, the new research fund goal was up $2,000 over last year's contributions goal in order to provide another fellowship for a Texas Tech agronomy student to assist in soil fertility research.

New officers of the committee are Stark Royall, president; Neil McAllister, first vice president; Frank Gray, second vice president, and Walter O'Neal, third vice president. Gene Linn of the Lubbock Chamber of Commerce was named secretary. All are from Lubbock.

Messrs. Royall, McAllister and O'Neal are representatives of the farm chemical industry and Mr. Gray is a farmer.

The committee is composed of area representatives of the agricultural chemicals industry, Texas agricultural extension service experiment station, technical researchers and teachers, farmers and farm organizations.

Supervisor Named to Niagara Position

MIDDLEPORT, N.Y.—Dr. Paul E. Drummond has been appointed supervisor of Niagara Chemical Division's organic synthesis group in Princeton, N.J. In this post, Dr. Drummond will be concerned with direction of synthesis work in all areas of pesticides—including herbicides, insecticides, fungicides and insect repellents. His group will closely coordinate its efforts with Niagara's research and development department at Middleport, N.Y.

Dr. Drummond, who joined the staff at FMC's Princeton research center in 1959, was educated at Boston College, Vanderbilt University and Massachusetts Institute of Technology.

U.S. BORAX REPORTS

LOS ANGELES — United States Borax & Chemical Corp. announced on Jan. 30 net income for the three months ended Dec. 31, 1960, amounted to $1,112,874.

SAFETY AWARD—The Norfolk plant of Smith-Douglass Co. was recently awarded the company's Presidential Trophy for its outstanding safety record. The trophy is awarded annually to one of the firm's 15 plants on the basis of man-hours worked, number of safety meetings, plant inspections and fire drills held in 1960. The safety program at Norfolk was initiated by L. M. Hanbury, plant superintendent, second from left in photo, who receives the trophy from Gaither T. Newman, third from left, as W. F. Combs, left, safety supervisor and R. E. Hargrove, fertilizer department superintendent, look on.

Louisiana Aerial Applicators Hear Talks On Pesticides and State Recommendations

By Kirby L. Cockerham
Extension Entomologist

BATON ROUGE, LA. — Research and recent developments in airplanes and application equipment and techniques were principal themes of the recent sixth annual conference of the Louisiana Agricultural Aerial Applicators. The conference was held at Louisiana State University with Roy L. Pilkinton, president of the association, and Kirby L. Cockerham, extension entomologist, as general chairmen. The conference was jointly sponsored by the Louisiana Agricultural Extension Service and the Aerial Applicators Assn.

Insect control recommendations for 1961 were given on cotton, sugar cane, rice, pastures and forage crops. Also, regulations governing the use of 2,4-D for weed control was presented. These discussions were led by L. D. Newsom, Henry Long, Lewis Hill, Dan Clower and E. A. Epps of the Louisiana Experiment Station.

Aviation in Louisiana was discussed by Claude Kirkpatrick, director of public works in Louisiana. Ted Barfield of the Louisiana Public Works, discussed the Federal Aviation Agency and the aerial application industry. The federal regulations governing the Aerial Application Industry were discussed and explained for the benefit of the applicators.

Two new subjects were presented to the aerial applicators this year. The development of wettable powders for use in aerial application was discussed by J. R. Wheatley of the Union Carbide & Chemical Co. who reviewed industry's efforts in research and development of wettable powders and gave specifications for successful application with aircraft. Development and usage of weed control in farm crops was reviewed by John B. Baker and Wayne Bingham. Although there is probably no weed control being applied from planes in row crops, it is possible that material will be developed in the near future that can be applied with planes and the applicators were interested in keeping advised of these developments, it was said.

Featured speakers of the conference were Joseph C. Brusse, aeronautical engineer from Texas A&M College, and Joseph Lippert of the Grumman Aircraft Corp. Mr. Brusse reviewed research done at Texas A&M Experiment Station with particular reference to droplet size, swath width, and the effect of wind currents on driftage. He stressed the importance of droplet size and marking swath to prevent insecticides drifting and contaminating other crops in adjacent fields. Mr. Lippert discussed the developments in application equipment and techniques.

Several exhibits of aircraft equipment and accessories were put on display by representatives of various aircraft equipment companies, and a number of new agricultural planes were flown to Baton Rouge for exhibit and demonstration.

Cold weather and icy conditions in North Louisiana prevented a number of applicators from attending the conference, but the meeting was considered successful by those in attendance. The conference was concluded with the annual cocktail hour and bansuet at the Bellemont Motor banquet at the Bellemont Motor Hotel with Roy L. Pilkinton presiding as toastmaster.

Olin Mathieson to Award 4-H Youths This Year

LITTLE ROCK, ARK. — For the ninth consecutive year Olin Mathiesen Chemical Corp., Chemicals Division, will honor eight "graduates" of 4-H Club work with 4-H alumni recognition awards.

The recipients will be cited at the annual alumni banquet during the 40th National 4-H Club Congress at Little Roock in December. At that time they will receive gold alumni keys presented each year to eight former 4-H'ers who have "continued to live by 4-H ideals."

The alumni recognition program, conducted nationally by the cooperative extension service and the national 4-H service committee, is supported by Olin Mathieson.

Samuel L. Nevins, Mathieson vice president and director of the 4-H Committee, long has been interested in youth work. He has devoted much time to developing the scope of the 4-H alumni program, and has been one of the official hosts at the 4-H Club Congress since its inception.

USDA Pink Bollworm Expert Retires in Texas

CORPUS CHRISTI, TEXAS—After nearly 40 years in the service of the U.S. Department of Agriculture, Hugh Cavitt has retired. His last job was as district leader of the pink bollworm control staff at Corpus Christi, but he had worked with the pest control division of the USDA since 1923.

Mr. Cavitt's greatest performance was against the pink bollworm. He worked closely with farmers, ginners and other scientists in the cotton business in carrying on an effective and cooperative program.

Mr. Cavitt, with his wife and three children, will continue to make their home in Corpus Christi.

SALES SESSION—The agricultural chemicals department of Commercial Solvents Corp. held its annual sales meeting recently at Monroe, La. Loy Everett, manager of the department, was in charge of the meeting attended by representatives of the sales, advertising, research and production departments.

Included on the program were representatives of the National Plant Food Institute, including: Dr. Robert Beacher, director of the Southern region, Atlanta; Zenas H. Beers, Midwest regional director, Chicago; and E. K. Chandler, staff representative of Shreveport.

Soil Samples Increase

ST. PAUL, MINN.—A total of 34,000 soil samples were processed in Minnesota during 1960, according to reports on the Minnesota Soil Sample Roundup sponsored jointly by the University of Minnesota, the Minnesota Fertilizer Industry Assn. and the National Plant Food Institute. New records were set for the number of samples received in the fall and the total number for the year. Despite unfavorable weather in the spring of 1960, the activity of the remainder of the year more than compensated for this temporary setback.

POTASH

Continued from page 2

138,237 tons K_2O, Canada, 99,495 tons, Cuba, 23,250 tons, Puerto Rico, 21,350 tons, and Hawaii, 22,880 tons K_2O. These figures include imports from Europe of 272,884 tons K_2O. Exports to other countries were 428,279 tons K_2O, an increase of nearly 38%. Deliveries of potash for non-agricultural purposes amounted to 151,274 tons K_2O, an increase of 3% over 1959. Total deliveries for all purposes were 4,909,440 tons of salts containing an equivalent of 2,884,765 tons K_2O, an increase of more than 3% in salts and K_2O.

Potash for agricultural purposes accounted for 95% of deliveries. Muriate of potash continued to be by far the most popular material comprising 94% of agricultural potash, API reported. Of the muriate, standard grade was 1,439,166 tons K_2O, while granular muriate was 1,122,450 tons, a decrease of 2% in the standard and an increase of 12% in the granular grade compared to 1959. Sulphate of potash and sulphate of potash-magnesia accounted for 6% of agricultural deliveries.

Total non-agricultural deliveries of 151,274 tons K_2O were about 5% of all potash deliveries and 3% over 1959. Included in these were 227,175 tons of muriate of potash containing an equivalent of 142,680 tons K_2O, 12,202 tons of sulphate of potash containing 6,178 tons K_2O, and 10,378 tons of manure salts containing 2,416 tons K_2O.

In continental United States, agricultural potash was delivered in 46 states and the District of Columbia. Illinois with over 200,000 tons K_2O was the leading state followed in order by Indiana, Georgia, and Ohio, each taking more than 160,000 tons K_2O during the year. Due to shipments across state lines, consumption does not necessarily correspond to deliveries within a state.

Stepan Report Shows Sales Gains for 1960

NORTHFIELD, ILL.—Stepan Chemical Co. had record sales and earnings in 1960, its March 6 annual report shows.

Sales totaled $20,560,938 compared with the $19,361,236 reported for 1959. Net income was $1,088,236 compared with 1959 net income of $750,131. On a per share basis, earnings were $1.55 and $1.07, respectively, after adjustment for a 5% stock dividend paid in December, 1960.

Stepan produces a broad line of basic and intermediate chemicals and operates plants at Millsdale, Ill., and Maywood, N.J.

BAG CARE

Continued from page 10

to evaporate moisture into the atmosphere.

5. Opening windows and skylights on damp and rainy days will permit air to absorb a considerable amount of moisture.

6. When bags are to be used immediately, open bales and spread out the bags in order to expose more of their surface to the air.

None of the above suggestions involve great expense, but any one of them might be of considerable aid in overcoming problems of dryness in bags.

Sewing Filled Bags

Reams of copy have been prepared instructing on methods and equipment for sewing filled bags. Here are some tips issued by Union Bag for the benefit of fertilizer and pesticide manufacturers:

Adjusting Sewing Head

Set a stitch at 3.5 stitches to the inch, making sure the needle clears all parts.

Look out for burrs on needle or other parts that could cut the thread.

Check to see that the pressure on presser foot is sufficient to make the bag feed through the sewing head properly.

Synchronize the sewing head and conveyor and adjust the vertical position of head to sew 1½ to 2 inches below the top edge of bag.

Finally, have the head low enough so that there is some vertical slack in bag top fin when sewing.

In operating the sewing head, do not attempt to pull or force the bag through the sewing head. It must be allowed to feed through naturally.

If a stronger and neater closure is desired, form the top of the filled bag prior to sewing by tucking in gussets.

Maintenance of sewing head is of great importance, too. One should keep the sewing head well oiled while it is in use. Make sure the oil cup is full and properly adjusted.

The sewing head should be cleaned daily with a bristle brush or air hose. And when the head is not in use, it should be dismounted from the column and stored in bath of light oil to avoid rust and corrosion.

1960's Pesticide Output 9% Greater Than 1959 Totals

WASHINGTON — Production of pesticides and other organic agricultural chemicals in 1960 amounted to 637 million lb., about 9% more than the 585 million lb. recorded in 1959, according to figures released by the U.S. Tariff Commission.

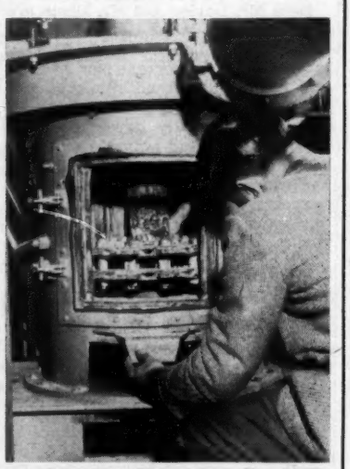
Sales in 1960 amounted to $253 million, the report says. In 1959, the estimated figure was $225 million. The report, first in a series on production and sales of synthetic organic chemicals in 1960, gives preliminary statistics for the year on pesticides by principal uses; fungicides, herbicides, insecticides, rodenticides, soil conditioners and soil fumigants.

The output of cyclic pesticides and other chemicals included in the cyclic group amounted to 517 million lb. in 1960—about 10% more than the 469 million lb. produced in 1959. Sales in 1960 were 446 million lb., valued at $196 million, compared with 410 million lb, valued at $172 million, in 1959. The chemical in this group which was produced in the greatest quantity in 1960—as in each year since it was first separately reported in 1944—was DDT. The output of this product in 1960 amounted to 164 million lb., a record high.

Production of cyclic pesticides and other acyclic organic agricultural chemicals in 1960 amounted 120 million lb., compared with the 117 million lb. reported for 1959. Sales in 1960 were 112 million lb., valued at $57 million, compared with 93 million lb., valued at $53 million, in 1959.

The statistics on production and sales in the Commission's preliminary report on pesticides and other organic agricultural chemicals are more than 95% complete. Complete statistics will be given in the Commission's final report on production and sales of synthetic organic chemicals in 1960, which will be issued later this year.

(Copies of the preliminary report on production and sales of pesticides and other organic agricultural chemicals may be obtained by writing to the U.S. Tariff Commission, Washington 25, D.C.)



PESTICIDE DUST MILL — Shell Chemical Co. has recently installed a new impact mill to enable its manufacture of 325-mesh DDT, aldrin and dieldrin products at Shell's plant at Simcoe, Ontario. The Sturtevant Pulver-Mill, described as an "air-swept impact mill with revolving impactors and deflector blades" enables Shell to manufacture up to 1,200 lb. an hour of 75% concentrates and a ton an hour of 50% concentrate. Shell had previously contracted for fine-screen dusts, but now makes its own, the company reports.

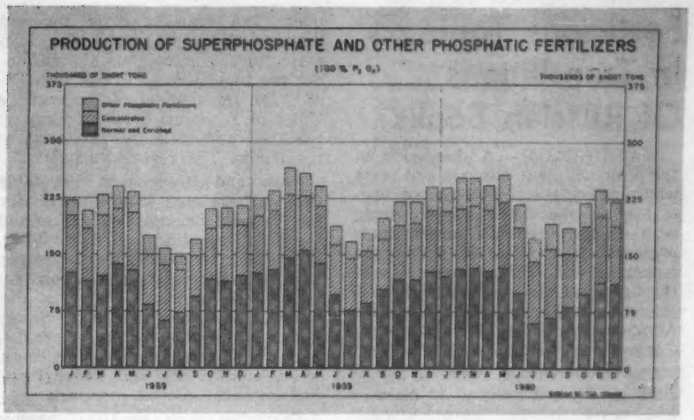
NAC Announces 1961 Convention Time, Place

WASHINGTON—The 28th annual meeting of the National Agricultural Chemicals Assn. will be held at The Homestead in Hot Springs, Virginia, Oct. 29-Nov. 1, it was announced by L. S. Hitchner, executive secretary of the association.

Details of the program for this annual meeting of manufacturers and formulators of pesticide chemicals will be released in the near future, Mr. Hitchner said.

EXPANSION COMPLETED

HOUSTON, TEXAS—Systems Engineering Co. has announced completion of its recent expansion program, including additional office and manufacturing facilities. The company designs and manufactures bulk handling equipment for the petrochemical and other industries.



SUPERPHOSPHATE PRODUCTION—Both production and shipments of phosphate in 1960 were ahead of the figures for 1959, the U.S. Department of Commerce has announced. Above is graph showing production during the past three years. The figures for December, 1960, just compiled, report that U.S. output of superphosphate and other phosphatic fertilizers was 219,476 short tons, compared with an output of 236,088 tons in December, 1959.

Pesticides Topic In Translations Of Russian Books

WASHINGTON — A discussion of the principal plant diseases and pests which affect the cultivation of vegetables in the Soviet Union, along with suggested control measures, is presented in a scientific publication translated from Russian and released through the Office of Technical Services, Business and Defense Services Administration, U.S. Department of Commerce, Washington 25, D.C.

The three methods discussed by the Russians for control of plant diseases and pests include "agrotechnical," prophylactic, and chemical measures. "Agrotechnical" is used in the same sense that "agricultural engineering" is used in the U.S.

Also available from OTS in translation is a Russian article on synthetic organic insecticides.

Both of the reports were translated through a cooperative federal agency translation program, coordinated by the National Science Foundation. Through this program, U.S. agencies select foreign technical material for translation in foreign countries. The translating is financed through the sale of surplus American agricultural commodities abroad, under the provisions of Public Law 83-480. The Department of Commerce's Office of Technical Services receives, catalogs, and sells this material to the public. The reports include:

Pests and Diseases of Vegetable Crops. Translated from Russian for the National Science Foundation and the U.S. Department of Agriculture. Written for the general reader rather than the specialist, this book describes the principal pests and diseases of vegetable crops in the Soviet Union. Included in the report are discussions of crop rotation, fertilizers, weed eradication, and prophylactic and chemical control measures.

Pesticides such as DDT, arsenic and fluorine compounds, nicotine sulfate, and pyrethrum are mentioned, among others, as being widely used in Russia. Price: $1.

On the Mode of Action of Insecticides. Translated from Russian for the National Science Foundation and the U.S. Department of the Interior. The manufacture of DDT and its compounds is considered of such importance in the USSR, according to this translation of an article from a Soviet biology journal, that a new branch of the Russian chemical industry was established to supply these insecticides. The article reviews the literature, from both Soviet and non-Russian sources, on DDT. Related data on other insecticides is included in the review. The report covers the action of DDT from its biochemical aspects, the functional and morphological changes caused by the compound, pathways of its penetration into an organism, its metabolism, and the causes of DDT-resistance in insects. Further investigation of the mechanisms of resistance of such insects as the common housefly is required before a choice of DDT-activating compounds can be made, the article notes. Price: 50¢.

MCA Meeting Planned

WASHINGTON—The 89th annual meeting of the Manufacturing Chemists Assn. will be held June 8-10, 1961, at the Greenbrier in White Sulphur Springs, W. Va., MCA has announced.

Robert B. Semple, president of Wyandotte Chemical Co., is program chairman for the meeting. Speakers and program will be announced at a later date.

More than 800 chemical industry executives attended the 1960 meeting, the association reports.

Consolidated Ships First Urea From Canadian Plant

CALGARY, ALBERTA, CANADA —The initial shipment of urea fertilizer took place recently from the new plant of The Consolidated Mining and Smelting Company of Canada, Ltd., at Calgary, Alberta.

The new plant, costing $5 million, has a rated capacity of 100 tons of urea a day and is located adjacent to the company's Alberta Nitrogen Department which has been producing ammonia and ammonium nitrate fertilizer since its construction during World War II.

Engineered by Vulcan-Cincinnati, Inc., the plant uses local natural gas as a raw material. Besides the plant itself, the company also erected a 10,000 ton urea storage building along with separate bagging and shipping facilities.

The normal urea product produced at the new plant will be in prilled form. Both ordinary and foliar grade fertilizer will be made and will be sold in western Canada and the U.S. Part of the production may be used as an animal feed supplement.

Urea will also be sold in solution, mostly as a urea-ammonium nitrate mixture containing 32% nitrogen.

Besides Cominco's fertilizer operations at Calgary, it also has fertilizer plants at Kimberley and Trail, B. C. Current total output is about 2,000 tons per day of dry and liquid fertilizers.

General Chemical Division Advances M. M. Darley

NEW YORK—Two key agricultural research appointments have been made by Allied Chemical's General Chemical Division, according to an announcement by John C. Fedoruk, technical director.

Merrill M. Darley, technical supervisor for the past 13 years, has been named manager of agricultural research. Leonard H. Dhein succeeds Mr. Darley as technical supervisor of agricultural research.

Mr. Darley, with the division 25 years, is an alumnus of Ohio State University at Columbus, where he earned an M.S. degree in entomology.

Mr. Dhein, with General Chemical eight years, was previously in planning and laboratory research. He holds a degree in chemical engineering from Charlottenburg Technische Hochschule in Berlin, Germany.

Both Mr. Darley and Mr. Dhein are headquartered at the General Chemical Research Laboratory in Morristown, N.J. An important part of General Chemical's broad research program is devoted to agricultural chemicals. Recently developed products include liquid polyethylene type spreader-sticker for pesticide sprays; herbicides for non-crop areas; an insecticide for control of citrus rust mites and many other pests, and a miticide.

Fall Fertilizer Sales Reported Brisk in Texas

COLLEGE STATION, TEXAS— Sales of fertilizers during the fall season of 1960 were considerably above those for the same period of 1959, and marked a continuance of increases every fall since 1955, according to a report just issued by Dr. J. F. Fudge, state chemist.

Fall sales of fertilizer, including both mixed goods and materials, totaled 97,354 tons in 1960. In 1959, the figure was 95,641 tons. In the four previous years, fall tonnages were listed as follows: 1958, 93,079 tons; 1957, 82,646 tons; 1956, 71,813 tons; and 1955, 63,153 tons.

The total tonnage of fertilizers sold during the fall of 1960 was 20% higher than the tonnage sold during the fall of 1955.

Sales of mixed goods in 1960, however, were about 9% lower than in 1959, but sales of materials were 5.3% higher, the report says.

TONNAGE REPORTS

Continued from page 5

amount of 17,770 tons, and in November, 1960, it was 14,113 tons.

Next most popular grade was 4-12-12 which increased in November, 1960, with sales of 4,964 tons against 3,296 tons the same month the year before.

ARKANSAS

LITTLE ROCK, ARK. — Sales of fertilizer in both materials and mixed grades increased during the period of July 1 through December 31, 1960, according to a report compiled by the State Plant Board. Mixed fertilizer sales totaled 61,634 tons during this 1960 period, and 58,714 tons in the same six month period of 1959.

Fertilizer materials likewise saw a gain in the last six months of 1960; a reported 40,773 tons against 38,901 tons during the final six months of 1959.

Of mixed fertilizers, 10-20-10 was the most popular, with sales of 9,053 tons in the last half of 1960, against 8,478 tons in the 1959 last half. The grade 0-24-24 was second place in the last half of both years. In 1960 it sold 3,396 tons and in 1959, 2,298 tons.

Ammonium nitrate, urea and anhydrous ammonia were the most popular sources of nitrogen last year, with these respective tonnages being reported: 9,638 tons for ammonium nitrate; 9,207 tons for urea, and 5,614 tons of anhydrous ammonia.

Superphosphate, 45%, led all phosphate sources, with 1,207 tons for the last half of 1960. This was a slight drop, however, from the 1,403 tons registered in the last six months of 1959.

FLORIDA

TALLAHASSEE, FLA — Consumption figures for the month of November, 1960, have been compiled for Florida by the State Department of Agriculture, Inspection Bureau, and released by Nat Mayo, supervising inspector.

According to the report, fertilizer materials totaled 70 699.47 tons that month, and mixed fertilizers, 164 - 780 31 tons.

In December, tonnages of mixed fertilizer were down considerably, totatling 114,045.58, but materials increased slightly to 71,007.70 tons.

OKLAHOMA

OKLAHOMA CITY — Fertilizer sales for November, 1960, were substantially ahead of sales for the same month of 1959, according to a detailed breakdown of tonnages made by state officials. The total tonnage for November, 1960. was 6,055 tons as compared to 4,606 tons in the same period of 1959.

The grade 10-20-10 was the most popular of mixed fertilizers for both 1960 and 1959. Sales of this grade for November of these years was, respectively, 1,712 and 1,612 tons.

NEW BUSINESS

BILLINGS, MONT. — Agrilease, Inc., a fertilizer manufacturing firm, has filed articles of incorporation listing $50,000 capital stock and incorporators and initial board of directors: Hal W. and Margaret O. Bick and John M. Dietrich, Jr.

PLANT

Continued from page 8

the plant have 20,000 gal. storage capacity each. Total finished product storage amounts to 156,000 gal. Phosphoric acid storage is 264,000 gal. in rubber lined tanks.

A combination of front end loader and auger is used to get the stored potash to the mixer, states Mr. Armstrong. The auger works until the pile gets low. Then the loader is used to pile more potash over the auger, from whence it is conveyed into the mixer via an elevator.

Lewis Martin, manager of the Martin enterprises, states that most farmers in the area use liquid fertilizer. They have tested and checked and find that it produces well for them. Quite a number of corn farmers use 500 lb. of balanced fertilizer on their land. Mr. Martin uses up to 800 lb. an acre on his corn land, plus 150 to 200 lb. at planting time.

If a farmer wants his soil tested, he can do it through the Martin firm which sends the samples to the state soil lab. Most corn farmers in the region know that liberal amounts of fertilizer produce extra corn at low cost, and so they are eager to have their land well fertilized. Most of them have their own applicators, although the Martins will apply the product if the customer desires. Charges for applicating run to $1.50 an acre, plus materials.

On their 2,500-acre farm, the Martins raise 350,000 bu. corn, which requires a great deal of fertilizer. When the Martins have plenty of quality corn they can use it in making pellet feeds, or they can store it in two open silos, said to be the largest of their kind in the world. (Each is 60 ft. wide and 300 ft. long and 24 ft. high. The walls tilt outward slightly and are built of 10 ft. concrete sections, eight inches thick.)

"We sold quite a bit of fertilizer in 1960 and expect to do even better in a similar period in 1961," says Mr. Martin. "Farmers know we can mix just about any analyses they use on corn or wheat, and that we can get the mixture to them within hours and apply it if they wish. This is service they like."

The credit problem in selling fertilizer is simplified somewhat due to the fact that fertilizer customers are feed customers as well. Credit ratings for one product carry over when selling another product to the same customer, Mr. Martin reports.

"Sometimes with the big feeders we find they'll owe us $10,000 to $20,000 at one time, and some of this is for fertilizer," reports Mr. Martin. "But they pay, and if they are slow we go after our money."

Since the Martin firm also sells farm implements and some field seeds, Lewis Martin feels that his company has something to sell to the farmer twelve months a year This is important, he states, for providing employment for a sizeable work force all year long.

The firm advertises fertilizer and other products in a local newspaper and through direct mail. Occasionally fertilizer meetings are held at the big implement store, with experts talking about sound fertilizer practices. Educational work like this pays off in better sales, Mr. Martin declares.

Croplife®

A BUSINESS PAPER FOR THE FARM CHEMICAL INDUSTRY

Variety of Ideas . . .

Plant Managers, Answering Questionnaire, See Need for Better Equipment and Workers

ASIDE FROM the voluminous statistical content to be found in returns from the recent Croplife survey among U.S. fertilizer plants using the TVA continuous ammoniator were numerous comments giving additional insight on what plant superintendents and fertilizer plant management men in general are thinking.

Space on the questionnaire was provided for comments and for a baring of the manager's soul, as it were, in telling what he regards as his main operating problem. Many took pen in hand and proceeded to tell all.

Some observations were routine, as might be expected. Comments on the lack of uniformity of products were fairly numerous, as were some rather unflattering allusions to old machinery which "breaks down too often"; to problems of material setting up in bags; of sparger deterioration; of cold water cooling off the ammoniator in winter, and of lack of cooling facilities in hot summer months.

While many respondents wrote at some length about the shortcomings of machinery and facilities in general, others found themselves discussing personnel with a considerable amount of eloquence and vigor.

One weary superintendent in the middle west said: "What do I consider my main operating problem? It is training personnel to THINK and to understand the process. In our plant, MEN are more of a problem than equipment is."

Another plant superintendent, in the Gulf area, indicated that his problem would be much less severe if the company could somehow secure some "dedicated plant personnel."

Though far removed geographically from the previous two commentators, a general manager of the East Coast observed that "keeping operators doing a good control job requires very careful supervision, and must be kept at continually."

With the cooperation of the Tennessee Valley Authority, which developed the continuous ammoniator, Croplife sent the questionnaire to some 150 plants across the nation. Replies were received from a large percentage of these, indicating an interest in their learning how similar plants are using the continuous ammoniator and how the success of others compares with their own.

If the survey proves anything, it is the wide differences seen in plant equipment, in sizes of ammoniators, coolers, dryers; in types and construction of spargers; of great variations in grades manufactured in these plants; and of moisture content of different ratios of fertilizers.

One of the widest differences in replies was in answer to the question concerning life of the sparger. Here estimates ranged from a low of 10 hours to a maximum of 3 years. As would be expected, the acid spargers had a much shorter life expectancy than those used for introducing solutions. But the disparity between 10 hours and three years seems rather odd, even taking into account the different corrosive properties of acid and solutions.

One reporter said his acid spargers last as long as two years . . . another, three weeks. Others reported two days; 3 months; 6 months; 8 months; 1 year; 1 week; and the low man on the reporting list, 10 hours.

Differences in the size of coolers and dryers appear to be considerable. The most popular cooler size was reported as being 5′ x 30′, but those 7′ x 40′ ran a close second in the reports. Several reported having coolers 8′ x 50′; 6′ x 40′; and some 7′ x 30′. Others ran from a huge 9′ x 60′ cooler down to a 5′ x 14′ size.

Dryer dimensions were about as diverse. Here the size receiving most mention was 8′ in diameter by 50′ in length. Several were reported to be 7′ x 40′ and 6′ x 40′, while others mentioned by more than one respondent included 8′ x 40′; 5′ x 35′; 6′ x 50′; 8′ x 45′; 7′ x 30′; 5′ x 25′; and 8′ x 60′. Other sizes getting single mention included 5′ x 28.5′; 6′ x 35′; 6′ x 25′; 7′ x 32′; 4′ x 45′; 10.5′ x 30′; 5′ x 30′; 5′ x 40′; 6′ x 36′; 6.5′ x 30′; 5′ x 24′; and 10′ x 24′.

All of the above appeared to be getting good performance out of their equipment and none of these voiced any particular dissatisfaction with the units.

Of interest also is the fact that more than half of the respondents said their dryers were concurrent rather than countercurrent.

It is likely that any group of five experts from the fertilizer industry would give as many interpretations to the results obtained in the survey.

To the personnel man, the complaint that employees need more savvy would cause him to say, "We are constantly improving the quality of men employed in the plant." The general manager, hearing comments about breakdowns of machinery at critical times, might interpret the situation as calling for more modern equipment; the plant owner, seeing a number of references to inventory shrinkage via dust, through ammonia loss, or in the dryer, would likely react by saying, "Something's got to be done about these losses!"

Thus the results of any survey mean different things to people with varying backgrounds and responsibilities.

Of considerable significance, we think, was the unusually high incidence of reference to need for more uniformity of raw materials. It would be interesting to take a similar survey, say, two or three years hence to see if this complaint might have subsided somewhat. Basic producers are already aware of this need, as was pointed out so well at the industry's round table session last fall. They are taking constant steps toward uniformity which has already shown up in some instances.

We hope the reader will carefully look over the survey results printed elsewhere in this issue, and glean from it information that will be useful in gaining a better picture of what some of the industry problems are.

Pesticide Production Set To Meet Demands of 1961

REPORTS FROM various states indicate the likelihood of unusual numbers of insect pests for the 1961 season. Pesticide manufacturers will of course keep a watchful eye on developments as spring approaches and insect prospects are known more definitely.

In Illinois, for instance, the face fly is expected to be an important pest of livestock in 1961, according to predictions by entomologists in that state. In other areas, the European corn borer, corn earworm, boll weevil and pests of stored grain are said to be expected in number in the months ahead.

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Rates: 20¢ per word; minimum charge $3.00. Situations wanted, 15¢ a word; $2.25 minimum. Count six words of signature, whether for direct reply or keyed care this office. If advertisement is keyed, care of this office, 25¢ per insertion additional charged for forwarding replies. Commercial advertising not accepted in classified advertising department. Display advertising accepted for insertion at minimum rate of $12 per column inch.

All Want Ads cash with order.

HELP WANTED

CHEMICAL ENGINEER WITH FERTIlizer experience wanted, to conduct bench scale and pilot plant work. Florida location. Address Ad No. 6588, Croplife, Minneapolis 40, Minn.

FERTILIZER RESEARCH DEPARTMENT requires new supervisor with experience in fertilizer production and research. Write Smith-Douglass Co., Inc., Box 419, Dept. CR, Norfolk, Va.

RESEARCH SUPERVISOR WANTED TO head new fertilizer research department. Several years' experience in fertilizer production or research and development. Location — seaport city, Middle Atlantic States. Address Ad No. 6590, Croplife, Minneapolis 40, Minn.

MANUFACTURER OF AGRICULTURAL chemicals needs salesmen with 3-10 years' tilizer and fertilizer materials to fertilizer manufacturers and dealers in southeastern United States. Travel moderate to heavy; car furnished and expenses paid. Salary commensurate with experience and ability. Send resumé to: Personnel Director, experience in sales or distribution of fer- P.O. Box 467, Pensacola, Fla.

ASSISTANT PLANT SUPERINTENDENT— Leading western fertilizer producer needs assistant plant superintendent. Desire chemical engineer, metallurgist or chemist, experienced in fertilizer production and supervision for integrated sulphuric, phosphoric, ammonia phosphate and fertilizer plant in Northwest area. Excellent benefits and starting salary with advancement opportunities. All applications held in strict confidence. Address Ad No. 6608, Croplife, Minneapolis 40, Minn.

REQUIRED IMMEDIATELY

FERTILIZER SUPERINTENDENT

Canadian Chemical Manufacturer requires Plant Superintendent for its fertilizer plant located in Southern Ontario.

Applicants should have proven single and triple fertilizer experience, should be between the ages of 30 and 45 and be willing to live permanently in Canada.

All applications will be held in the strictest confidence and will be answered.

Address Ad No. 6593, Croplife Minneapolis 40, Minn.

Sohio Chemical Co.

Agricultural Field Sales Representative

Construction of new plant and expansion of sales territory creates need for additional agricultural sales representative for Nebraska, Minnesota and Iowa. Should have one to three years' experience in sales related to nitrogen solutions, combination ammonia, ammonium nitrate, urea solutions 45 and 46% urea. Please send resume including academic background, work experience and salary requirement to: R. J. Shalk, Employee Relations Division, Sohio Chemical Co., Box 628, Lima, Ohio.

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Panel Discussions on Speaking Agenda At CFA Conference

POMONA, CAL. — Panel discussions on nitrogen and micronutrients as well as talks on various agronomic subjects by representatives of the University of California and the fertilizer industry are on the agenda for the 9th California Fertilizer Conference March 27-28. Site of the meeting is California State Polytechnic College, Pomona, and sponsor is the California Fertilizer Assn.

George Park, vice chairman, Northern California, for the CFA soil improvement committee is convention chairman.

How recent reorganization within the California State Department of Agriculture may affect the fertilizer industry will be discussed by DeWitt Bishop of the state department of agriculture, Sacramento.

Another talk, "Future of Nitrogen in California" will be presented by Haven Leavitt, Shell Development Co., Modesto, Cal.

A panel discussion on micronutrients is scheduled for March 27, with Mordy S. Rose, J. F. Sloan Co., Salinas, as moderator. Appearing on this portion of the program as panel members will be Randy Keim, Wilson & George Meyer & Co., San Francisco; Dr. Thomas Embleton, University of California, Riverside; Dr. John Lingle, Dr. Carl Hansen, Dr. K. Uriu and Dr. James Cook, all of the University of California, Davis.

A second panel on nitrogen is scheduled for March 28, with Dr. R. L. Luckhardt, Collier Carbon & Chemical Corp., Los Angeles, moderator. On his panel will be Dr. William E. Martin, University of California, Davis; John Pryor, John Pryor Co., Salinas; J. W. Chapman, Fresno Agricultural Chemical Co., Fresno; D. W. Galbraith, Agriform Chemical Co., Inc., Woodland, Cal.; and Howard H. Hawkins, Golden State Plant Food Co., Glendora, Cal.

The CFA banquet will be held the evening of March 27.

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March 22-24—North Central Branch meeting, Entomological Society of America, Hotel President, Kansas City, Mo.

March 27-28—Ninth annual California Fertilizer Conference, Kellogg-Voorhis Campus of California State Polytechnic College, Pomona.

April 12-14—Chemurgic Council, 26th annual conference, Sheraton-Gibson Hotel, Cincinnati, Ohio.

June 11-14—National Plant Food Institute, annual meeting, The Greenbrier Hotel, White Sulphur Springs, W.Va.

June 27-29—Twelfth Annual Fertilizer Conference of the Pacific Northwest, Marion Hotel, Salem, Ore. Chairman: B. R. Bertramson, agronomist, Washington State University, Pullman.

July 19-21—Southwest Fertilizer Conference and Grade Hearing, Galvez Hotel, Galveston, Texas.

Aug. 16-20—Canadian Fertilizer Assn. annual convention, Manoir Richelieu, Murray Bay, Quebec. R. P. Pennington, 2 Carlton St., Toronto 2, Ont., secretary-treasurer.

Oct. 29-Nov. 1—National Agricultural Chemicals Assn., 28th annual meeting, Homestead Hotel, Hot Springs, Va.

Nov. 2-3 — Pacific Northwest Plant Food Assn. annual convention, Hotel Gearhart, Gearhart, Oregon.

Nov. 7-10—Packaging Machinery Manufacturers' Institute Show of 1961, Cobo Hall, Detroit, Mich.

Nov. 12-14 — California Fertilizer Assn., thirty-eighth annual convention; Jack Tar Hotel, San Francisco.

1962

Jan. 17-19, 1962 — Southern Weed Conference, Hotel Patten, Chattanooga, Tenn.; Dr. R. E. Frans, Dept. of Agronomy, University of Arkansas, Fayetteville, secretary-treasurer.

CALENDAR FOR 1961-62

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English Firm Changes Name

NEW YORK—S. B. Penick & Co. has announced that its associate company in England, C. F. Gerhardt Ltd., will henceforth be known as Gerhardt-Penick Ltd.

The new name reflects the traditional status of C. F. Gerhardt Ltd., originally a botanical drug and raw materials company established in 1864, as well as its close relationship with the Penick organization in New York.

For many years C. F. Gerhardt Ltd. acted as sole agents in the United Kingdom for S. B. Penick & Co. and in 1952 was acquired by Penick.

SMITH-DOUGLASS REPORT

NORFOLK, VA. — Smith-Douglass Co., Inc., has reported net sales of $21,335,840 for the six months ended Jan. 31. 1961, and net income of $812,096. This compares to net sales of $19,948,252 and net income of $1,270,901 for the same period in 1960.

RETIRED CHEMIST DIES

NASHVILLE, TENN. — John K. Archey, 82, formerly operator of Archey Chemical Co., West Nashville, died Feb. 14 after an illness of long duration.

IMC Announces Automated System of Order Handling

SKOKIE, ILL.—A fully-automated order handling system has been introduced by International Minerals & Chemical Corp. to help fertilizer manufacturers during the heavy production season.

Speed in order handling and delivery, technical assistance held ready on a standby basis in all sections of the country, and an "advance loading" program based on recently-completed industrial engineering studies, are all a part of the program, according to L. W. Gopp, IMC vice president in charge of sales. Mr. Gopp added that the new system is the production season phase of IMC's year-round customer service program. He explained that during the off-season, IMC offers services to aid manufacturers in realizing optimum sales when the busy season arrives. During that season, emphasis is shifted to technical assistance where needed and also to marketing and sales aids.

The IMC executive said that the new automated order handling system can cut down delivery time by as much as three days. The plan, he said, enables the order and waybill to be flashed immediately, upon receipt, to the appropriate plant and railroad with both acting on the order within a matter of minutes.

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